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Technical Supplement
OPERATIONAL AND COST ANALYSES OF THE RESTRUCTURING ALTERNATIVES
Volume Two

U.S. Department of Transportation

Illinois Department of Transportation

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TECHNICAL SUPPLEMENT

OPERATIONAL AND COST ANALYSES OF RESTRUCTURING ALTERNATIVES: VOLUME TWO - DETAILED REPORT

ST. LOUIS METRO AREA
RAIL GATEWAY ENTERPRISE

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FOREWORD

CONSAD Research Corporation, under contract to the Illinois Department of Transportation, has conducted detailed railroad operations and cost analyses of several proposed alternatives for the restructuring of physical facilities and operating patterns in the St. Louis-East St. Louis Railroad Terminal Area. This work is an integral element of Phase II of a comprehensive three phase planning effort in the St. Louis-East St. Louis Terminal Area, and has been conducted under the supervision of a Railroad Technical Advisory Committee comprised of representatives of the seventeen railroads operating in the terminal area. Along with CONSAD, SEK, a joint venture by Sverdrup & Parcel and Associates, Inc.; Envirodyne Engineers, Inc.; and Lester B. Knight and Associates, Inc., has performed engineering and environmental analyses related to the restructuring study.

This report is the concluding element in a series of CONSAD work products developed for Phase II of the restructuring study. Its purpose is to describe the major issues related to the restructuring effort, document the methodologies employed in the analysis of railroad operations and costs, and present the results of these analyses. CONSAD has also produced 25 detailed working papers and memoranda related to the conduct of this study. These documents, with the exception of those containing information defined as confidential under Section I of the Interstate Commerce Act, are available for examination at the offices of the Federal Railroad Administration, Room 5415, 400 Seventh Street, S.W., Washington, D.C.

EXECUTIVE SUMMARY

In 1971, studies began on an effort to restructure the railroad gateway terminal in the St. Louis metropolitan area. The three primary objectives of the project were and are:

- To provide opportunities for economic development in the area
- To reduce railroad/community conflicts
- To improve railroad operational efficiency within the Gateway.

Initial studies, concluded in 1974, resulted in a plan for rail switching operations to be consolidated into one major yard. This was judged by the railroads to be infeasible. These studies were followed by a more careful, three-phased effort to produce feasible alternatives, to make detailed evaluations, and to implement the best plan. In 1977, the "Phase I" efforts produced two plans which were considered satisfactory. Phase II studies were begun in 1978 under the guidance of the Illinois Department of Transportation; a Railroad Technical Advisory Committee (RTAC), composed of representatives of the then 17 railroads operating in the area; and the Federal Railroad Administration (FRA).

Through their consultants, these parties have now produced the detailed evaluation of the two Phase I alternatives, as well as of one new alternative and of the required "No-Build" option. The evaluations included the following elements:

- establishment of appropriate subordinate goals and parameters, and compilation of a complete traffic data base and environmental inventories, including projections to the years 1985 and 2000
- application of sound analytical techniques to measure both the performance and the impacts of these alternatives across such factors as:
    - Railroad transit time through the Gateway, the reliability of this transit time, and the cost of operations
    - Social, economic, environmental and energy-related considerations.

The results of these efforts show that:

- The results of implementing any of the Build Alternatives are more favorable with regard to rail operations than is continuing with the current (No-Build) facilities and strategies
- The Three-Yard Bidirectional Alternative shows the most improvement when compared to the No-Build on the bases of transit time, reliability and cost of operations

- The environmental and other impacts of the build alternatives are generally preferable to those of projected conditions under the No-Build case, and where they are not, appropriate strategies can be devised to mitigate the impacts.

- The Three-Yard Bidirectional Alternative generally has fewer adverse environmental impacts than the other Alternatives.

This document is part of the Environmental Impact Statement (EIS), which will be published to document these studies and to solicit the further input of all concerned agencies and parties on these findings. The RTAC has already recommended approval of the Three-Yard Bidirectional Alternative (at a meeting held on February 25, 1981), conditional on resolution of certain specific issues, and on the ratification of the Railroad Steering Committee. The basic issues yet to be resolved are as follows:

- Decisions on any institutional or railroad corporate changes which should occur

- Definition of the nature of the entity or entities who would operate any new facilities to be constructed (a New Yard under the Three-Yard Alternatives, and a new common Trailer-on-Flatcar Yard under both the Two-Yard and the Three-Yard Alternatives)

- Decisions on the order in which improvements should be undertaken, with those actions having the least adverse environmental impacts and the most attractive rates-of-return on a stand-alone basis being most likely to occur early

- Decisions on the financing strategy for the project and its elements. The FRA has indicated that its funding for the project would most likely be in the form of preference-share-purchase (a form of low-interest loans authorized under Section 505 of the Rail Revitalization and Regulatory Reform Act of 1976). The extent and nature of other financing has yet to be determined, but individual railroad and public agency funding of specific project elements would hasten implementation.

Careful review of the studies which have been performed is key to understanding this complex and valuable project. The Draft EIS and its accompanying Technical Supplements provide documentation of the studies and evaluations performed. The rail operational and cost analyses are summarized in the attached report.

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1.0 INTRODUCTION AND SCOPE

1.1 Introduction

The St. Louis Metro Area Rail Gateway Enterprise (MARGE) study had its contemporary origins in 1971 with a request from the East-West Gateway Coordinating Council to the FRA to "restructure" the railroads in the St. Louis Terminal Area. The request arose from concerns about the economic, social, and environmental problems of the area. The result of that request was a study which recommended the consolidation of all road train switching into a single large yard. Evaluation of that recommendation by the railroads involved at that time, resulted in rejection of the plan. The recommended facility was, at a minimum, twice as large (measured in either length or cars handled) as any facility in the United States, and involved the application of operating strategies and technologies either untried or unproven. With this rejection, the railroads recognized a need to provide a workable alternative to the study recommendation. The railroads met that need by working with the Federal Railroad Administration (FRA) to develop, with the assistance of a contractor, the Phase I Study (An Analysis of the Terminal Restructuring Plan - Phase I, December 1977, CONSAD Research Corporation).

The Phase I study resulted in the Railroad Technical Advisory Committee (RTAC) identifying a three-yard configuration as most feasible, with sixteen of the seventeen involved railroads concurring with the selection. The seventeenth, Missouri Pacific, favored a two-yard configuration. Based on the traffic loads anticipated at the two major classification

yards in the Phase I horizon year, 1990, the three-yard configuration with directional operation appeared to be most efficient. The two-yard configuration in Phase I was conceived to be able to function only in a directional operating strategy, since one of the two common yards could not be reasonably expanded to handle the required birdirectional traffic volume.

The Phase II Study was undertaken by the Illinois Department of Transportation (IDOT) for FRA. IDOT engaged two primary contractors, CONSAD Research Corporation and SEK, a joint venture by Sverdrup & Parcel and Associates, Inc.; Envirodyne Engineers, Inc.; and Lester B. Knight and Associates, Inc. CONSAD's role in Phase II was to perform detailed operations analyses of the rail restructuring plans selected in Phase I, to perform detailed costing studies of the operations in order to provide information for the railroads which would assist them in selecting an alternative for restructuring, and to provide necessary input to SEK for their preparation of an Environmental Impact Statement. SEK performed the rail (and related highway) engineering, capital cost estimation, and analysis of project impacts.

The definition of the key parameters of the CONSAD portion of the Phase II study was the first step in the analytical process. Jointly, with IDOT and the RTAC, CONSAD established the parameters discussed below.

The Two-Yard Directional Alternative and the Three-Yard Directional Alternative were initially selected for analysis. Based on study findings and their implications with regard to the directional strategy, a bidirectional strategy for the three-yard configuration was also examined in detail. The definition of the base case, "No Build" Alternative, was agreed upon as being: The operation of the terminal area in future years, according to the same strategies and with the same facilities, under the same organizational structure as today, and handling the same inbound and outbound traffic as assumed for the Build Alternatives, with the exception of improved management information system interface and recognizing the potential impact that pending mergers may have on operations in the study area.

The basic horizon year for planning was chosen to be 2000. At the request of RTAC, CONSAD agreed to examine operations in the year 1985 so that a shorter term picture would be clear to all participants. It was understood that the physical restructuring proposed would probably not be completed by the year 1985, and that the Environmental Impact Statement would address itself to year 2000 conditions only.

In order to determine the growth (or decline) that traffic through the study area might experience between the 1979 data base year and the 1985 and 2000 horizon years, each railroad was asked to furnish growth projections for three classes of traffic: unit trains (primarily, but not exclusively, coal); Trailer/Container-on-Flatcar (TOFC/COFC); and general merchandise.

The data base used in Phase I was deemed to be inadequate for the purposes of the Phase II study. The individual RTAC representatives indicated that historical data in the form requested was virtually unattainable in machine readable form. The result was the selection of Friday, March 30, 1979 as the data base day. The date proved to be as close to ideal for the purposes of this study as could be imagined. While no day is necessarily representative for all roads, the day was found to be heavy, with relatively few random interruptions (derailments, etc.).

A common TOFC/COFC intermodal facility had been examined in Phase I at a relatively low level of detail. CONSAD recognized the implication of this and collected detailed field data on intermodal operations immediately after March 30, 1979 study date so as to be able to apply the best analysis techniques to this sensitive area.

The primary goals of the restructuring effort were threefold:

- To provide opportunities for community economic development;
- To reduce railroad/community conflicts; and
- To improve railroad efficiency within the St. Louis Terminal Area.

These goals were the focus of CONSAD's efforts. A result of the striving to attain these goals was the establishment of subordinate goals more directly linked to railroad operations. For example, the goal of providing opportunities for development translates into restructuring rail operations, shifting them into geographic areas less suited for other development, and moving rail operations out of those areas perceived to be highly suited for non-rail development. Specifically, the expansion of Gateway Yard in a southeasterly direction, the expansion of Madison Yard or the construction of New Yard in the general area between Q Tower and CP Junction (see Exhibit 1.1-St. Louis Marge Exhibit A), and the freeing of riverfront property now occupied by the Baltimore and Ohio (BO), the Louisville and Nashville (LN), and the Terminal Railroad Association of St. Louis (TRRA) have been identified as being consistent with the development objective.

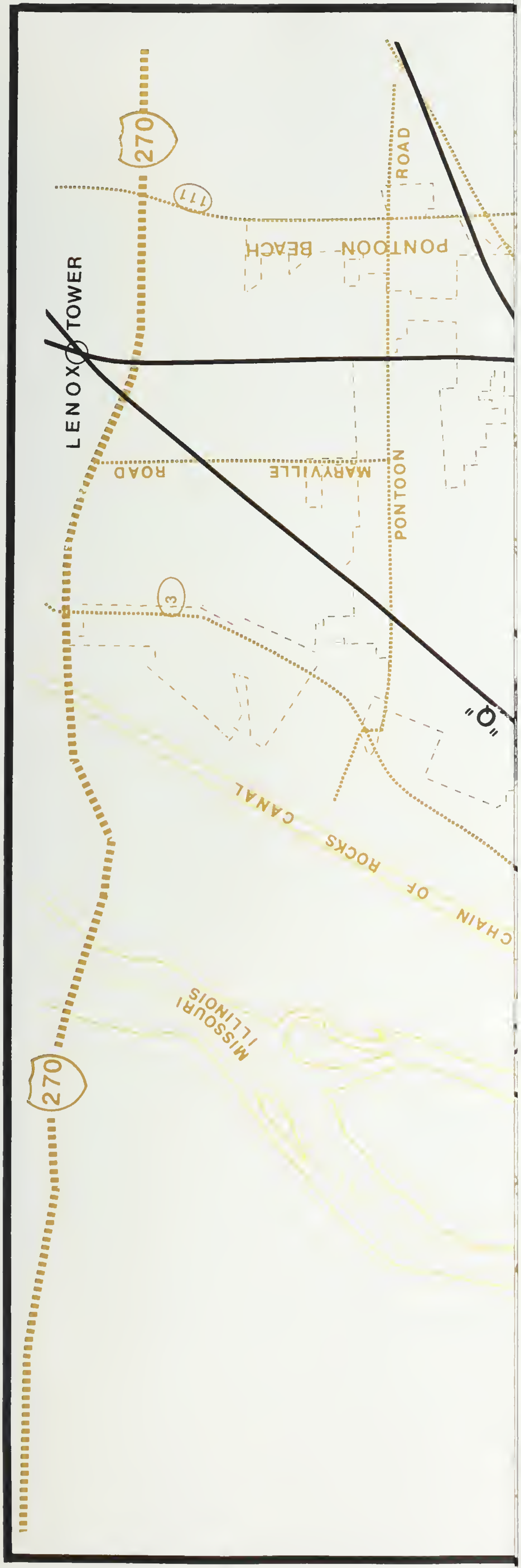

EXHIBIT A

STUDY AREA

VICINITY MAP

LEGEND

ROUTE 3 RELOCATION AREA	▨
RAILROADS	—
INTERSTATES	▮▮▮▮▮▮▮▮▮▮
PROPOSED RAILROAD YARD	▨
CITY STREETS	┈┈┈┈
EXISTING RAILROAD YARD	▨

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SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

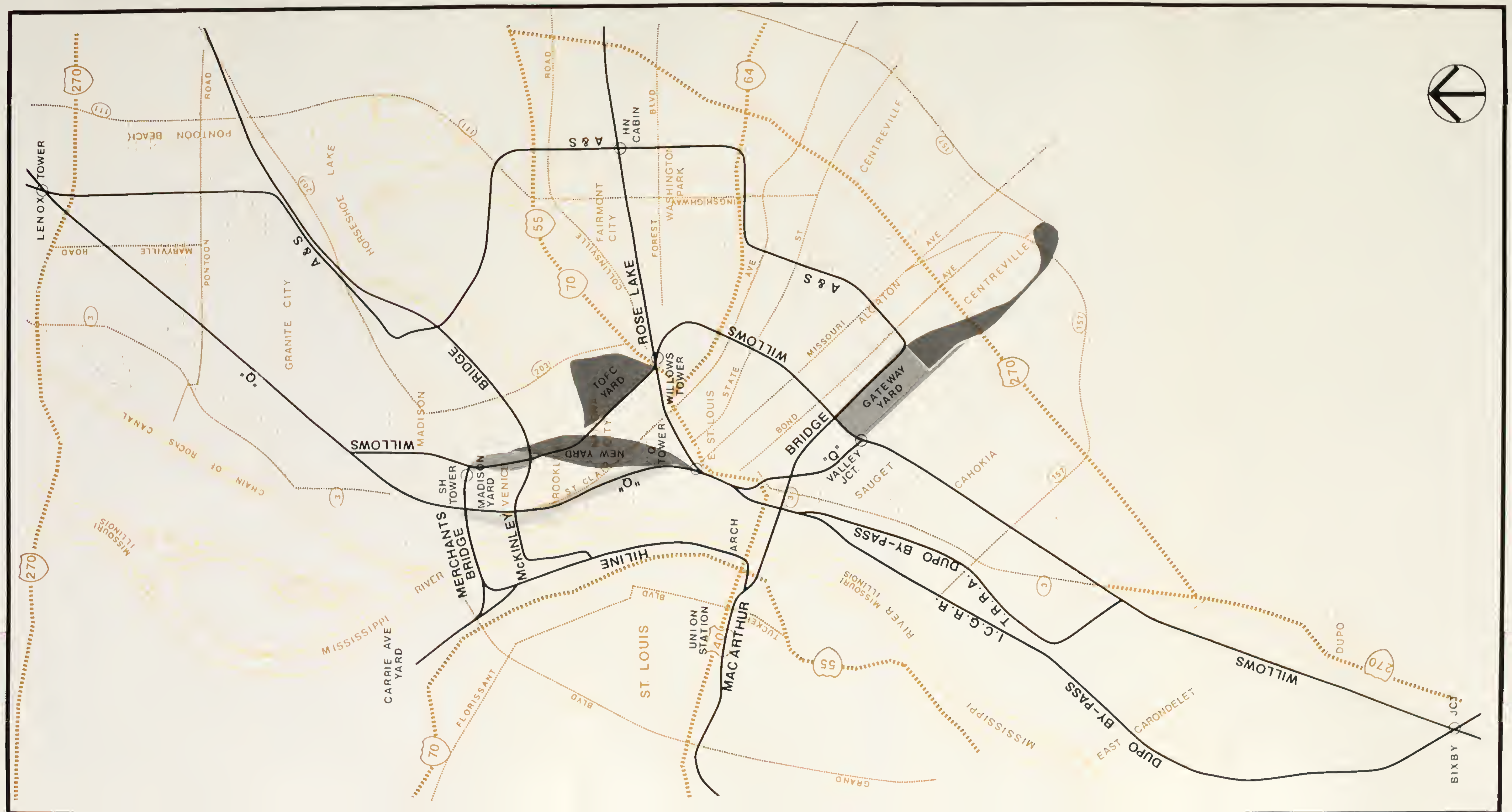


EXHIBIT A

STUDY AREA

VICINITY MAP

LEGEND

ROUTE 3 RELOCATION AREA	▨
RAILROADS	—
INTERSTATES	┈
PROPOSED RAILROAD YARD	■
CITY STREETS	┈
EXISTING RAILROAD YARD	▨

6000 3000 0 5700

SCALE IN FEET

ST. LOUIS MARGE PROJECT
SVERDRUP/ENVIRODYNE/KNIGHT

On the other hand, it has been harder to establish subordinate goals consistent with the primary goal of reducing railroad/community conflicts because, for example, expansion of some yards increases the conflict between these two sectors. This has been addressed by the proposal to construct 17 to 18 grade-separation structures in the terminal area.

Finally, the goal to improve railroad efficiency within the St. Louis Terminal Area has been translated into several subordinate goals which area readily measurable, and hence readily comparable among alternatives. The first subordinate goal, expressed at the first Railroad Steering Committee (RSC) meeting, was to reduce the number of times a car is handled (switched) between origin and destination. Another subordinate goal, expressed at the same RSC meeting, was to improve corridor operations. Throughout Phase I and Phase II, the railroad companies have expressed the view that operations within the St. Louis Terminal Area are, at present levels, excessively costly, unreliable, and slow. These terms, cost, reliability, and speed, are quantifiable, and hence can be compared among various restructuring alternatives.

1.2 Scope of Phase II Study

The study of rail operations in St. Louis, once the parameters were defined, turned toward a definition of the study area. Due to the complex relationship that can exist between line-haul operations and terminal operations, it is inappropriate to define rigid boundaries for the study of a rail terminal area. The general boundaries decided upon were Bixby (Illinois Central Gulf (ICG)-Missouri Pacific (MP) Crossing)

on the south, the several junctions of the Alton and Southern main line with line-haul carriers on the east and northeast, Missouri-Kansas-Texas (MKT) Baden Yard on the north, and TRRA Carrie Avenue Yard and MP-TRRA-St. Louis-San Francisco (SLSF)-Norfolk and Western (NW) Grand Avenue on the west. In general, operations within these boundaries were considered to be within the study area.

The analytical scope of railroad operations analysis within these geographic boundaries were varied as to level of detail and amount of data collected and analyzed. Operations that were common in nature, such as joint or multi-carrier yards (Gateway, Madison, New Yard) were examined in great detail. Yards falling within the geographic study area, but operated by and for a single line-haul carrier were grouped in a category called "home yards". These were studied in some detail within the No Build Alternative, since they would have to handle the overflow from the common yards, but within the Build Alternatives were studied only to the extent their function impacted on either rail operations in the common yards, or the freeing of rail-occupied land for redevelopment. Corridors used solely by one or two carriers under both the No Build and Build Alternatives, in approximately the same way, and seen as having no major role in restructured corridor operations were considered in less detail. Corridors that fed the major common switching facilities were studied in detail, with upgrading often considered in the Build Alternatives. The operation of the joint TOFC/COFC facility was studied in great detail; on the other hand, the operation of individual TOFC/COFC facilities that were operated by carriers who did not indicate a desire to participate in the common facility were examined in a more cursory manner.

Both the railroads and the communities involved have a strong desire to improve the usage patterns of the riverfront land. Conflicts between communities and railroads are well documented. The desire of the community and the railroads to lessen their impacts on each other is also strong. The desire of the railroads to avoid the congestion, inefficiency, expense, and unreliability of the study area rail network has historically motivated several pure rail operating changes. The common starting point for satisfying all of these desires is the effective restructuring of rail operations in the study area.

It must be pointed out that not all of the improvements in operation in the St. Louis Terminal Area will result from facility changes. Many of the changes hypothesized in Phase II require new institutional arrangements, such as the implementation of trackage rights. The exact nature of such institutional changes is beyond the scope of CONSAD's work. The change must, however, allow the hypothesized operations to occur. If the institutional changes do not, for example, allow certain trains to use certain corridors to reach the common yard, then either provision must be made to use other corridors, or to handle the train at another common facility or home yard. In either case, the alternative scheme may result in higher operating cost, or less effective movement (less reliable or slower) of the cars. In all fairness, there may be cases where alternative routing and/or handlings are beneficial. It is anticipated, however, that the failure to provide institutional arrangements suitable for the operations described under the various Build Alternatives will provide for less effective restructured rail operations.

Within the study's geographic and analytic scope, and mindful of the limitations this places on the study, the ultimate aim of CONSAD's efforts was to analyze railroad operations under each of the several proposed alternatives for restructuring physical facilities and operating patterns in the St. Louis Terminal Area; and thereby provide measures of the operational and cost-effectiveness of the various alternatives. These measures of effectiveness could then serve as valuable input to the process of determining which restructuring alternative would best meet the goals established for the restructuring effort, which would be the first step toward the selection and eventual implementation of a plan to deal with the problems in the study area.

2.0 ALTERNATIVE RESTRUCTURING PLANS

2.1 Current Situation

Rail operations in the study area are divided geographically by the Mississippi River, which is also the state boundary between Missouri on the west and Illinois on the east. The operations are also divided, institutionally, among 17 railroad companies and the City of St. Louis, Missouri, which owns and controls the operation of the MacArthur Bridge Commission.

Rail operations on the west, or Missouri, side are conducted predominantly by Burlington Northern (BN), Missouri Pacific (MP), St. Louis-San Francisco (SLSF), Chicago, Rock Island and Pacific (CRIP), Norfolk and Western (NW), and Missouri-Kansas-Texas (MKT), which are Class I line-haul carriers, and the Manufacturers Railway Company (MRS) and Terminal Railroad Association of St. Louis (TRRA), which are switching carriers. The major yards on the Missouri side are operated by Missouri Pacific (12th Street), St. Louis-San Francisco (Lindenwood) and Norfolk and Western (Luther), with other carriers operating several lesser yards. The major rail terminal functions performed on the Missouri side are the make-up and break-up of trains by each of the roads in their own facilities and industrial switching, performed primarily by MP, NW, AND TRRA. Interchange of traffic between railroads on the west side is limited.

The balance of the railroads operating in the study area have yard facilities on the east, or Illinois, side. Missouri Pacific, Norfolk and Western, and Terminal Railroad Association of St. Louis also have facilities in Illinois. Each road operating on the Illinois side performs train make-up and break-up in its own facilities, except the Norfolk and Western. TRRA performs most of the industrial switching on the east side. Interchange between carriers on the east side is primarily performed by the Alton and Southern (AS) and TRRA, although several pairs of line-haul carriers have direct connections with one another. Exhibit 2.1 shows the rail carriers operating in the study area, along with the yard each operates and the direct connections each has.

The traffic entering the study area, for the purpose of the overall restructuring study, consists of blocks of cars on freight trains operated by the line-haul railroads. The passenger traffic in the area, ten or less trains per day, is not a major consideration in restructuring, although existing passenger train routes have been identified and the maintenance of these routes for passenger traffic has been an objective. Freight trains fall into three categories: 1) run-thru trains, i.e. trains which require no switching in the study area; 2) preblocked trains, that is, trains whose cars are in groups, or blocks, so that minimal handling is required to move the cars to a destination; and 3) switch trains, which must be broken up into individual cuts of cars and reassembled with other switch and preblocked train traffic for subsequent movement. Due to the varying business levels in the rail industry, run-thru train sometimes include blocks to be set off at intermediate points, and preblocked trains often include one or more blocks of switch traffic. Thus, the distinctions among these three categories of trains are somewhat vague.

Exhibit 2.1: Railroad Operating in the Study Area

Roads	Yards (11)		Owership Comments	Direct Connections (15)
	Illinois	Missouri		
Baltimore and Ohio (BO)[1]	Cone			AS, ICG, NW, SOU, TRRA
Burlington Northern (BN)[2]	E. St. Louis (12)	North S. Louis		AS, CR, ITC, MKT, NW, TRRA
Chicago and North Western (CNW)	Madison			AS, CR, ICG, ITC, SOU, TRRA
Chicago, Rock Island and Pacific (CRIP)[3]		Carrie Avenue	St. Louis Southwestern	TRRA
Conrail (CR)	Roselake			AS, BN, CNW, ICG, ITC, LN, SOU, TRRA
Illinois Central Gulf (ICG)	Valley Jct. Venice			AS, BO, CNW, CR, ITC, LN, MP, NW, SSW, SOU, TRRA
Illinois Terminal (ITC)[4]	McKinley, Port		(13)	AS, BN, CNW, CR, ICG, MKT, NW, SOU, TRRA
Louisivlle and Nashville (LN)[5]	3rd Street			AS, BO, BN, ICG, SOU, TRRA
Missouri-Kansas-Texas (MKT)		Baden		BN, ITC, TRRA
Missouri Pacific (MP)[6]	Mitchell			AS, ICG, MRS, SLSF, SSW, TRRA
Norfolk and Western (NW)[7]	Brooklyn	Luther		AS, BO, BN, MP, NW, TRRA
St. Louis-San Francisco (SLSF)[8]		Lindenwood		MP, NW, TRRA
St. Louis Southwestern (SSW)[9]	Valley Jct.		Southern Pacific	AS, ICG, MP, TRRA
Southern (SOU)[10]	Coapman			AS, BO, CNW, CR, ICG, ITC, LN, MP, TRRA
Alton and Southern (AS)	Gateway		MP-½ SSW-½	BO, BN, CNW, CR, ICG, ITC, LN, MRS, MP, NW, SOU, SSW, TRRA
Terminal Railroad Association of St. Louis (TRRA)	CD, Madison Wiggins 2	11th Street Bremen, Carrie Pickrel	(14)	AS, BO, BN, CNW, CRIP, CR, ICG, ITC, LN, MRS, MKT, MP, NW, SLSF, SSW, SOU
Manufacturers (MRS)		Barton Street	Anheuser-Busch	AS, MP, TRRA

Footnotes found on following page.

Footnotes to Exhibit 2.1: Railroads Operating in the Study Area

1. Part of Chessie System -Chessie and Family Lines formed CSX holding company 1980.
2. Merged with SLSF - 1980
3. Ceased operations March 1980 - acquired by SSW 1980.
4. Announced liquidation 1980 - to be acquired by NW.(see note 13)
5. Part of Family Lines -Family Lines and Chessie formed CSX holding company - 1980
6. MP and Union Pacific have filed a merger application.
7. NW and SOU have announced merger plans.
8. Merged with BN - 1980
9. Acquired RI St. Louis - Tucumcari, NM line - 1980.
10. SOU and NW have announced merger plans.
11. Yards as shown in SRI report FRA/ORD-76/304 "Railroad Classification Yard Technology" July 1976 Final Report, with local names shown for clarity in reference in this report.
12. Operations ceased 1978.
13. Current (1980) Illinois Terminal ownership.

Chessie	1/11	RI	1/11
MP	1/11	CR	1/11
BN	1/11	NW	2/11
ICG	2/11	CNW	1/11
SLSF	1/11		

14. Current (1980) Terminal Railroad Association of St. Louis ownership.

Chessie	1/16	MKT	1/16
BN	1/16	MP	3/16
RI	1/16	SP	1/16
CR	2/16	SLSF	1/16
ICG	2/16	SOU	
Family Lines	1/16	NW	1/16

15. From "The Official Railway Equipment Register" October 1977
Not all direct connections shown are used for interchange regularly
Various intermediate arrangements are used (i.e. SLSF-AS via MP).

In general, an inbound switch or preblocked train of a line-haul carrier operates into that railroad's study area facility, referred to herein as a home yard. At that home yard, the road engines and caboose are detached and placed in appropriate servicing facilities. In the case of switch trains (or switch blocks on preblocked trains) the switching is accomplished so that the local industry cars are available to local industry crews, the direct connection cars are available for movement to the direct connection, and the balance of the cars are available for movement to one of the switch carriers, who acts as an intermediary between the inbound line-haul carrier and the outbound line-haul carrier. These cars are then transferred to the switch carrier, who separates them into classifications for further movement. The cars are then transferred to the home yard of the outbound carrier, where they are incorporated into outbound trains. The result of this effort is that these cars are generally switched three times within the study area. Cars arriving in blocks not requiring switching in the inbound carriers' home yard move to the switch carrier, or to an outbound carrier directly, and thus require one or two fewer handlings. This results in reduced expense and time involved in study area handling; however, in most cases these savings are offset by somewhat greater time switching expense incurred at the line-haul carriers facility where the blocks were made.

The carriers operating through the study area have directed their efforts toward reducing the number of times each car must be handled (switched) while moving through the terminal area. These efforts have resulted in run-thru trains such as Conrail's train INCB which operates from Indianapolis, Indiana to Pine Bluff, Arkansas with the normal handling required in the study area being to provide corridor trackage and a place to change crews, and preblocked trains such as Conrail's train

INTR which has a block each for NW Luther Yard, MKT Baden Yard, and TRRA Madison Yard. The cars moving on INCB do not require switching at all in the study area, and the cars in the NW and MKT blocks of INTR require switching only once in the study area. The cars in the TRRA Madison block will normally require switching at Madison and at an outbound road home yard, or at a study area industry yard, before forwarding.

The result of the type of improvements cited above has been twofold. The first, and probably desired result, has been a reduction in the transit time and expense of moving the cars in the run-thru and blocks through the study area. The second result, which is probably undesired, but equally unavoidable, given the expense levels associated with the handling of cars described in the general case, has been that traffic moving through the study area is subject to wide variances in transit time. In the case of a car that should have moved in a run-thru train that is actually handled in a switch block or train, the transit time can increase from, for example, three hours to three days. This dispersion of transit times has tended to cause the study area rail operation to be viewed as an unpredictable bottleneck that should be eliminated.

For several reasons, the rail facilities in the study area have not been improved at the rate which would be desired to provide for facilities capable of effectively handling increased levels of traffic. Alton and Southern modified Gateway Yard in the 1950's and early 1960's into a hump yard from a flat yard, and then from a single hump to a dual hump in the middle 1970's. A&S also improved corridors under its control with the installation of welded rail. However, the basic designs of the corridors and yards within the terminal is such that larger cars and longer trains have taxed these facilities beyond the point of efficiency. The multiplicity of handlings has made the cost, both in terms of time and money, of moving cars through the study area high. This, along with the combination of a wide dispersion off transit times, obsolete yard and corridor designs, and expensive switching charges, has resulted in making the St. Louis-East St. Louis Terminal Area a place to be avoided, if reasonably possible.

2.2 Future Restructuring Alternatives

The Railroad Steering Committee (RSC) goal of decreasing the number of times a car is handled between origin and destination was perceived to be best met by reducing the number of times the car was switched in the study area. The purpose of the many handlings in the current operation is to subdivide the classification load so that each yard makes only a small number of classifications. The number of final outbound classifications on most inbound trains exceeds the number of classifications made at the inbound yard. Therefore, the logical manner of restructuring to reduce car handlings is to provide an inbound yard, or yards, with sufficient classification capability to put as many cars as possible into their final outbound block.

The proposals advanced in the Phase I Study are remarkably similar, in spite of the names, Two-Yard and Three-Yard. Each plan provides two facilities, each large enough to handle roughly half of the potential common yard switching loads. Each common yard must be able to receive inbound road trains and classify the outbound blocks necessary to run outbound road trains from that yard.

The primary factor defining the difference between the alternatives is the common yards. The corridor system, and the TOFC facilities, are essentially dependent on these yards. Between restructuring alternatives the common yards may differ with respect to both their physical facilities and their projected traffic loads. Summaries of the physical characteristics and traffic loads for each common yard under each restructuring alternative are presented in Exhibit 2.2 and 2.3, respectively.

2.2.1 No Build

The No Build Alternative for restructuring rail operations in the St. Louis-East St. Louis area assumes that the only changes that will occur are those that result from increased traffic levels based on the growth projections of the railroads, and from improved management information systems, such as the Freight Car Scheduling Program. No specific changes in physical plant or operating strategies are assumed in the No Build Alternative.

The increased traffic levels will allow an increase in preblocking in a few cases, and will probably result in a small increase in the number of run-thru trains and a larger increase in the number of unit trains. The increase in the number of unit trains, primarily carrying coal, reflects a belief that coal consumption in the Nation, therefore unit trains passing through the St. Louis area, will increase.

The current common yard switching facilities consist of TRRA Madison Yard and AS Gateway Yard. Each functions as a bidirectional yard, that is, since the two switching carriers operate in an independent and competitive mode, each yard receives road trains and transfers from all directions. The two yards, and switch carriers, normally function competitively and independently of one another. However, when a brief surge in traffic or an accident temporarily impairs the efficiency of one facility, the line-haul carriers who can do so shift some portion of their

Exhibit 2.2: Physical Characteristics of Common Yards by Alternative

	No Build		Two-Yard Directional		Three-Yard Directional			Three-Yard Bidirectional		
	Madison 1979	Gateway 1979	Madison 2000	Gateway 2000	Madison 2000	New Yard 2000	Gateway 2000	Madison 2000	New Yard 2000	Gateway 2000
Receiving Tracks										
Number	14	16	17	30	14	20	30	14	15	20
Capacity (Cars)	682	962	1540	3268	682	2640	3268	682	1968	2125
Bowl Tracks										
Number	40	54	40	72	40	72	72	40	72	72
Capacity (Cars)	1280	2417	1840	2958	1280	3010	2958	1280	3010	2958
Departure Tracks										
Number	26	12	23	30	26	20	30	26	15	30
Capacity (Cars)	1122	1057	1996	3822	1122	2740	3822	1122	1988	2898

Exhibit 2.3: Projected Common Yard Traffic by Alternative

		Daily Traffic Loads			
Year	Alternative	Yard	Inbound Trains	Outbound Trains	Number of Cars to Switch
1985	No Build	Gateway	29	29	1995
		Madison	29	32	1450
	Two-Yard Directional	Gateway	44	52	3243
		Madison	33	42	2060
	Three-Yard Directional	Gateway	49	55	3357
		New Yard	34	46	2342
		Madison	22	25	833
	Three-Yard Bidirectional	Gateway	42	48	2767
		New Yard	35	42	2320
		Madison	22	25	833
2000	No Build	Gateway	30	35	2313
		Madison	25	33	1707
	Two-Yard Directional	Gateway	44	51	4017
		Madison	34	49	2548
	Three-Yard Directional	Gateway	50	55	4207
		New Yard	37	46	3214
		Madison	23	25	1013
	Three-Yard Bidirectional	Gateway	42	47	3352
		New Yard	37	40	3187
		Madison	23	25	1013

Note: There would be a significantly larger number of home yard car switches under the No Build Alternative than under any of the Build Alternatives.

traffic from one switch carrier to the other. The frequent result of this type of shift is to eventually impair the efficiency of that other carrier's operations.

TRRA Madison Yard is a side-by-side single hump facility that also serves as an industrial support yard for industries located in the northern portion of the east side of the study area. The major industry supported directly from Madison is the National Steel Corporation's Granite City Steel complex, consisting of mill and blast furnace divisions. The nature of the steel business requires that the railroad serving the complex hold various accumulations of cars for the steel company, for example, coal, coke, iron ore, and empty finished-steel cars. These accumulations can exceed 400 cars at any one time. The other types of industrial activity supported from Madison Yard includes fertilizer, railroad cross tie treatment, scrap dealers, and metal processing. Each of these industrial activities can, from time to time, generate substantial backlogs of inbound cars. Thus, Madison Yard and the surrounding supporting or sub-yards (Carworks Yard, Hookey Yard, Freight Mains, and Eastern Connection Yard) function not only as train and interchange yards, but as important industrial support and holding facilities.

The hump operation at Madison Yard commenced in 1975. Prior to that time, Madison was a large flat-switching yard. As presently operated, Madison Yard consists of 11 receiving tracks, 3 receiving/departure tracks, 26 departure/industrial tracks and 40 bowl tracks. There is a single lead over the hump on the north end of the yard, connected to two parallel hump approach leads which lead to the Merchants Bridge.

The approach to the Merchants Bridge must be used when humping cuts greater than approximately 50 cars in length, a practice which has often led to congestion of bridge traffic. There are two pullout leads on the south end of the yard, running through a complex called CP Junction, which is the crossing of two lines of the ITC (used by CNW and ICG as well as ITC) and one line of NW (currently out of service) with the junction of four lines of the TRRA (SH-CP; CP-Willows; CP-Bridge Junction/CD; and CP-Wiggins).

A&S Gateway Yard is a folded, in-line double hump operation. The hump operation was commenced in the early 1960's, and the second hump was placed in operation in the early 1970's. The receiving yard of 16 tracks lies on the north side of the yard, connected by two curved leads to the dual hump. The bowl contains 54 tracks, which are connected to the 12 departure tracks by four pullout leads. Seven of the departure tracks are effectively continuations of the pullout leads, while the other five are parallel to the bowl, reached in a pull-shove operation.

The major function performed is the receipt, classification and dispatch of road trains of several line haul carriers, and the similar receipt and dispatch of transfers. Interchange of cars is accomplished by their being switched in Gateway. There is also a modest amount of industrial activity supported from Gateway, using the facilities described above.

The corridors of TRRA and AS are generally "yard limit operations" (20 MPH maximum speed) supervised by dispatchers and yardmasters, who primarily control trains by use of radio, telephone, and instructions to operators of manned interlocking towers and junctions. Most of these corridors have a relatively high density of street crossings at grade with the railroads.

These are no common or joint TOFC/COFC facilities in the study area. Each line-haul carrier in the study area operates at least one TOFC/COFC facility, except the Illinois Terminal, which does not participate in TOFC/COFC business as an originating or terminating carrier. Interchange of TOFC traffic between carriers is generally accomplished by rubber interchange, that is, the trailer is grounded at the inbound carrier's facility, hauled to the outbound carrier's facility by a truck tractor, and loaded on another flat car for further movement.

2.2.2 Two-Yard Directional Alternative.

In the Two-Yard Directional Alternative, the first of three Build Alternatives to be discussed, the train operation of the line-haul carriers would be redirected so that switch trains of eastern carriers (i.e. those operating mostly east of the Mississippi River) would generally be routed into an expanded Madison Yard instead of into their several home yards. Trains of western carriers would generally be operated out of Madison Yard. Trains of western carriers would be operated into an expanded Gateway Yard, with the outbound trains of eastern carriers operated from Gateway Yard.

The expansion at Madison Yard would consist of extending the receiving tracks, which lie along the west side of the yard, in a southwesterly direction along the line of the current rail corridor extending from CP Junction to Bridge Junction, with the standing car capacity of the receiving track increasing 126 percent, from 682 cars (14 tracks) to 1540 cars (17 tracks). The 40 classification tracks in the bowl would be extended an average of 14 car lengths each, with a resultant increase in total classification track capacity of 44 percent (1,280 to 1,840 car lengths). The number of pull out leads at the south end of the bowl would be increased from two to three, and the departure yard capacity would be increased 78 percent, from 1122 car lengths (26 tracks) to 1996 car lengths (23 tracks).

The capacity of Gateway Yard would be expanded by constructing a new receiving yard to the southeast of the existing bowl and hump leads and in line with them, increasing receiving yard capacity 240 percent, from 962 car lengths (16 tracks) to 3268 car lengths (30 tracks). A new departure yard would be constructed along the southwest side of the existing bowl which would increase the standing capacity of the departure yard from its present 1057 car lengths (12 tracks) to 3822 car lengths (30 tracks), a 262 percent increase. The four existing pullout leads would be maintained. The number of bowl tracks would be increased from 54 to 72, with a standing capacity increase of 22 percent (2417 to 2958 car lengths).

The corridors in the study area would be upgraded from the present 20 MPH yard limit operation to basically a 40 MPH operation, except where curvature prohibits, and subject to the installation of a signal and control system to allow the attainment of the maximum train speed for those design criteria. Also, sixteen grade separations would be constructed to relieve railroad-highway interference. (See Exhibit 2.4 for a list of proposed grade separations).

Exhibit 2.4: Proposed Rail-Highway Grade Separations by Alternative

Highway Name	City	Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
Pontoon Road	Granite City	X	X	X
Illinois Route 111	Fairmont City	X	X	X
Collinsville Road	Fairmont City			X
Monsanto Road and Illinois Route 3	Sauget	X	X	X
Jerome Lane	Cahokia	X	X	X
Mildred Lane	Cahokia	X	X	X
Illinois Route 157	Cahokia	X	X	X
E. Carondelet Road	Dupo	X	X	X
Black Lane	Caseyville	X	X	X
Forrest Boulevard	Washington Park	X	X	
Market	Venice	X	X	X
Canal	Brooklyn	X	X	X
Mousette	Centreville	X	X	X
Bellview	Centreville	X	X	X
SR 157	Centreville	X	X	X
Broadway	East St. Louis	X	X	X

In addition to the corridor upgrading, connections at corridor junctions would be made to allow the logical use of corridors without regard to ownership or current contractual restrictions. The most significant of these changes is the construction of four connections in the vicinity of Venice, Illinois to allow use of Merchants and McKinley Bridges as a paired operation, and to provide access to and from these bridges to the Q corridor.

The last ingredient of the Two-Yard Directional Alternative is the construction of a common TOFC/COFC facility at a site near the northeast quadrant of the Willows corridor/Rose Lake corridor crossing at Willows Tower. This common facility would consist of 13 loading and unloading tracks supported by necessary storage and engine/caboose servicing tracks to allow at least eight line-haul carriers (those who have expressed a desire to do so) to operate TOFC trains and transfers with TOFC traffic into and out of the facility, eliminating, at least for those carriers, the necessity of interchanging trailers over the highway.

The advantages seen in the Two-Yard Directional Alternative prior to its detailed evaluation were (1) consolidation of traffic into logical groups so that the maximum number of cars would be dispatched with one handling and (2) minimum construction and associated impacts necessary to accomplish these goals.

2.2.3 Three-Yard Directional Alternative.

The Three-Yard Directional Alternative has essentially the same operating strategy as the Two-Yard Directional Alternative, except that a New Yard is to be constructed in lieu of expanding Madison Yard. The New Yard is to be larger than the expanded Madison Yard in terms of receiving yard capacity, bowl size and capacity, and departure yard capacity. Its role is essentially the same as that of expanded Madison in the Two-Yard Directional Alternative, except that the industrial support activity will continue to be conducted at Madison Yard. Since the New Yard facility could be designed with more capacity, some roads, notably Missouri Pacific, have stated that if the Three-Yard Directional Alternative were adopted and implemented, they would operate their outbound trains to the south, now operated from Dupo, from the New Yard. This would decrease the number of times their cars must be switched, and hence was seen as an advantage over the Two-Yard Directional Alternative.

The site chosen for the New Yard to be constructed is between CP Junction and Q Tower, with the hump leads extending from the vicinity of CP Junction north and northeast along the Willows corridor to the vicinity of WR Tower. This site was seen as desirable because it is centrally located to the railroad operation, it generally covers land area already primarily dedicated to rail and rail-oriented uses, and good access to the corridor system can be provided. A final desirable point to the Three-Yard Directional Alternative was that Madison Yard, with very little modification, could remain in operation during the construction of New Yard, and then be used for its current industrial support role with greater efficiency, as well as assuming an expanded role in serving industry on the Missouri side of the study area.

these eastern carriers (or western carriers) operate their trains into one common yard and out of the other. In the bidirectional concept, several railroads operate trains into and out of both major common yards (Gateway and New). This has the significant advantage of greatly reducing the number of cars transfered between the common yards and thus, reduces the number of car handlings or switches in the study area. Bidirectional operations also greatly lower the requirements for the transfer of engines and cabooses between the common yards. These advantages are somewhat offset by the fact that, under bidirectional operations, maximum groupings of cars for any particular destination generally do not occur as often as under directional operations. This is the result of several railroads operating separate trains with the same destination blocks out of both major common yards under bidirectional operations. Another slight disadvantage of bidirectional operations is that the delay resulting from cars missing their scheduled trains would generally be greater under bidirectional than directional operations, since fewer trains carrying any particular destination block are run from each common facility in the bidirectional case.

3.0 METHODS OF ANALYSIS

It should first be noted that the analysis performed by CONSAD, while described in detail herein, is fully documented in a series of 25 working papers and memoranda. An annotated list of these is included in Appendix A of this report. The documents themselves, save for those containing material defined as "confidential" under Section I of the Interstate Commerce Act, are available for inspection at the offices of the Federal Railroad Administration, Room 5415, 400 Seventh St., S.W., Washington, D.C.

3.1 Traffic Data

3.1.1 Development of the Traffic Data Base

The collection of adequate data concerning traffic moving through and within the study area was, in itself, a large and complex effort.

In order to fully specify all traffic moving in the study area on March 30, 1979, the study day for the project, CONSAD requested that each railroad provide train consists, interchange reports, tower interlocking sheets, and train dispatchers records for that day. Subsequently, each railroad TAC member was contacted to review the data and to supplement it with other required information. Approximately 500 trains were identified as having moved on March 30, 1979. A basic inventory of trains was created, showing:

- Railroad company operating the train;
- Railroad company train symbol;

- Study train symbol (4 digits used for computer identification);
- Engine numbers;
- Tractive effort of engines;
- Caboose number;
- Entry point in the study area;
- Time entered;
- Number of cars (loaded and empty);
- Tonnage of train;
- Blocks on train and number of cars in each block;
- Route taken in study area;
- Destination road/yard/industry;
- Crew change requirements;
- Exit point from the study area; and
- Time exited.

In order to relate this information on train movements to car movements, the American Association of Railroads (AAR) Labor Management Task Force data base was utilized. The Task Force, in conjunction with the AAR, collects car movement data from most of the line-haul carriers in the St. Louis area. This data covers every movement of a car from the point at which it enters the study area to the point at which it exits. Access to the data base was acquired through the AAR with the permission of each railroad. Full documentation of the data base was obtained from AAR systems personnel.

Since it was necessary to trace the movement of each car in the study area on March 30, it was decided to examine data from at least four days on either side of March 30 to assure that the complete movement was traced (e.g., a car that was on an outbound train on March 30, probably came into the study area on March 26, 27, or 28 and, hence, car data for those days would have had to be examined to get a full trace on that car).

The data is organized by the data editing programs at the AAR into sets of pairs. There are two primary types of pairs, basic pairs and study area pairs. Basic pairs match the reported delivery of a car with the reported receipt of a car for each movement of that car in the study area. An individual car can have as many as 10 such pairs describing the handling of that car during the time it was in the study area. Study area pairs match the first and last event for a car in the study area. Usually, the first event is an inbound train arrival and the last event is an outbound train departure. The data provided by the AAR included both basic and study area pairs for all cars in the two week period. The tape provided has approximately 500,000 such records; each record was 220 characters long.

CONSAD prepared a series of programs to extract those pairs of interest in the study. The data was sorted and ordered by car initial and number. If the study area pair for a car indicated an outbound train departure prior to March 30 or an inbound train arrival after March 30, all records for that car were excluded from further consideration. The remaining records then contained all cars that arrived, departed or were on hand in the study area on March 30. Approximately 125,000 records of interest remained.

The train consists of March 30 provided by each road, were key-punched with block designations (inbound or outbound) assigned to each car as appropriate. Over 325 different block designations were identified. The train consist data (over 21,000 records) was then merged with the extracted AAR data such that all cars moving on March 30 had block designations assigned to them.

In order to develop an interchange matrix describing the volume of traffic in an inbound block moving to each outbound block, the study area pairs in the AAR/consist data were extracted and sorted into inbound trains and further sorted by outbound train within each inbound train. A sample page of that data is shown in Exhibit 3.1. The sample shows cars that entered the study area via Illinois Central Gulf (ICG) train GV3; the train that they were on when they left the study area; the state and city of their destination; the car initial and number; and the CONSAD block information obtained from the consists collected. Since the data covers movements over a two week period, the cars listed under each inbound train ID could have entered the study area on that inbound train on any day in the two week period up to and including March 30.

CONSAD also found that the study area pair data was not as consistent as anticipated. It was expected that the study pairs would show only inbound road trains and outbound road trains, however, various other

Exhibit 3.1: Sample Traffic Data Output

```
ROAD-INBD TRN  ROAD-OUTB TRN  ST  CITY       CARID       ---INBOUND BLOCKS---              ---OUTBOUND BLOCKS---
ICG     GV3    SLSF     33    AK  ASHDOWN    UTLX039942  VF05ICESTR
--------------------------------------------------------------------------------------------------------------
               SLSF     33    NM  CARLSBAD   PLMX010373  AV94ICESTL
                              OK  HOBART     SP  696363                                        2622SFTULS
                                  TULSA      GATX093015
--------------------------------------------------------------------------------------------------------------
               SLSF     35    KS  NEODESHA   PSPX033100  AV94ICESTL
                              MO  KANCITY    NAHX093873                                        2624SFSPFD
                                  SPRINGFIE  BNFE005176                                        2624SFSPFD
--------------------------------------------------------------------------------------------------------------
                                             SSW 025835  VF05ICESTR
               SLSF    221    TE  MEMPHIS    RI  006572  VF05ICESTR
               ICG     000    AK  BRIAR      PTTX097534  AV94ICESTL
--------------------------------------------------------------------------------------------------------------
                              TX  HOUSTON    UTLX040023  AV94ICESTL
               MP     00DH    TX  BAYTOWN    GATX087474
                                  BAYTOWN    HPLX355097  AV94ICESTL
--------------------------------------------------------------------------------------------------------------
                                  CHOCOLATE  GATX011991  AV94ICESTL
                                             UTLX048483  AV94ICESTL
                                  FREEPORT   MP  266600  AV94ICESTL
--------------------------------------------------------------------------------------------------------------
               MP     00DN    LA  DONALDSON  ACFX062767
                              LA  NEW ORLEA  GATX010307                                        DX98MPNORL
                                  TAFT       NATX021721
--------------------------------------------------------------------------------------------------------------
                              TX  LONGVIEW   CCLX001116  AV94ICESTL
               BN    01108    IL  QUINCY     BN  475808  AV94ICESTL
               MP     0151    AR  BAUXITE J  MP  710456
--------------------------------------------------------------------------------------------------------------
                              MO  OPAN       CEI 718486                                        DX18MPDEXR
               MP     00FZ    TX  FORT WORT  GATX015009  AV94ICESTL
               MP     00MZ    TX  BISHOP     NATX076878                                        DX16MPSANA
--------------------------------------------------------------------------------------------------------------
                              TX  CHEMCEL    CELX004202                                        DX16MPSANA
                                  CHEMCEL    CELX013296  AV94ICESTL
               MP     0SKO    KS  ATCHISON   MP  114127
--------------------------------------------------------------------------------------------------------------
                              KS  SALINA     ROCK526502  AV94ICESTL
                                  WICHITA    EJE 005403
                                             VMCX015006
--------------------------------------------------------------------------------------------------------------
               MP     0SKY    MO  JEFFERSON  MP  126632
               MP     0SKZ    AR  PINE BLUF  MP  265871                                        2616MPKCTY
                                  HUTCHINSO  HN  001032                                        2616MPKCTY
--------------------------------------------------------------------------------------------------------------
                              MO  KANSAS CI  MP  353774                                        2616MPKCTY
                                  CHAN       MP  712067                                        2616MPKCTY
               SOU     111    TE  CHARLESTO  UTLX071731                                        S-03SOKNOX
--------------------------------------------------------------------------------------------------------------
                              TE  CHARLESTO  UTLX025276                                        S-03SOKNOX
                                  CHARLESTO  ACFX089531
                                  KINGSPORT  GATX010940                                        S-03SOKNOX
--------------------------------------------------------------------------------------------------------------
               SOU     123    GA  SANDERSV   BKTY018212                                        S-01SOMACO
                              IL  ESTLOUIS   SOU 527197                                        S-01SOMACO
               SOU     127    FL  MIAMI      BN  247801
--------------------------------------------------------------------------------------------------------------
                                  ESTLOUIS   SOU 528430
                                             SOU 066483
                                             TTX 604054
--------------------------------------------------------------------------------------------------------------
                              KY  LOUISVILL  GATX014172                                        S-05SOLOUS
                              NC  LEECREEK   TGAX121054
                              TE  CHARLESTO  UTLX025271
--------------------------------------------------------------------------------------------------------------
```

types of data showed up, including transfer moves and industry moves. Thus, a single car could have had more than one study area pair and could have been listed under more than one train.

CONSAD decided, therefore, to concentrate analysis efforts on those cars that were on an inbound road train on March 30, and to examine the basic pairs for each car to identify the intermediate moves before departure on an outbound road train. Exhibit 3.2 is a sample of that data showing ICG GV3 (with its corresponding CONSAD designation of "AV94").

All cars for each inbound train were not reported in the AAR data. The AAR has indicated that the quality of data received from each road varies. It was assumed that the cars missing from the report would be distributed to outbound trains in the same proportion as the cars that were reported.

After completing these calculations, all inbound traffic was assigned to an outbound train or to local industry (AAR data indicates if and when a car moves to or from industry). Although the Manufacturers Railway Company (MRS), the Illinois Terminal Railroad Company (ITC) and the Chicago, Rock Island and Pacific Railroad Company (CRIP) do not report to the AAR, a review of actual consists on March 30, allowed their outbound trains to be identified.

The traffic moving from local industry to outbound trains and traffic from the CRIP, ITC and the MRS were not included. To fill this gap, it was assumed that the volume of local industry and other missing road traffic moving to outbound trains on March 30 would approximate the volumes on the outbound trains built from inbound trains on March 30, described above.

Exhibit 3.2: Sample Traffic Data Output After Processing

CONSAD Train ID	Car ID	Station	Road Reporting	Activity Code	Road Train ID	Date & Time	Load/Emp	Station	Road	Activity Code	Road Train ID	Date & Time	Load/Empty		Destination		CONSAD Block ID	Line Number
AV94	LOAM264007	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	8	NATCHEZ	MS	ICESTL	89
AV94	LOAM264007	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	0	NATCHEZ	MS	ICESTL	90
AV94	MILW050464	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM5	79033117	L	8	CRYBRANCH	GA	ICESTL	91
AV94	MILW050464	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM5	79033117	L	0	CRYBRANCH	GA	ICESTL	92
AV94	MP 266600	VLYJCI	ICG	TA	GV3	79033004	E	CUPO M	MP	TD	00DH	79040402	E	8	FREEPORT	TX	ICESTL	93
AV94	MP 266600	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	ID	MP	79040218	E	0	ESTLOUIS	IL	ICESTL	94
AV94	MP 266600	VLYJCM	MP	IR	ICG	79040218	E	CUPO M	MP	TD	00DH	79040402	E	0	FREEPORT	TX	ICESTL	95
AV94	MP 718055	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	VSI	79033111	E	8	MCSHER	MO	ICESTL	96
AV94	MP 718055	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	YD	TCUT31	79033110	E	0	MCSHER	MO	ICESTL	97
AV94	MP 718055	VLYJCI	ICG	YD	TCUT31	79033110	E	VLYJCI	ICG	TD	VSI	79033111	E	0	MCSHER	MO	ICESTL	98
AV94	MP 721069	VLYJCI	ICG	TA	GV3	79033004	E	CUPO M	MP	TD	2151	79040316	E	8	BAUXITE	AR	ICESTL	99
AV94	MP 721069	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	ID	MP	79033119	E	0	BAUXITE	AK	ICESTL	100
AV94	MP 721069	VLYJCM	MP	IR	ICG	79040118	E	DUPO M	MP	TD	2151	79040316	E	0	BAUXITE	AR	ICESTL	101
AV94	MP 823029	VLYJCI	ICG	TA	GV3	79033004	E	CUPO M	MP	TD	2151	79040316	E	8	PERKINS	AR	ICESTL	102
AV94	MP 823029	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	ID	MP	79033119	E	0	MCUPINE	AK	ICESTL	103
AV94	MP 823029	VLYJCM	MP	IR	ICG	79040118	E	DUPO M	MP	TD	2151	79040316	E	0	PERKINS	AR	ICESTL	104
AV94	MSTL053616	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SD1	79033110	L	8	TILDEN	IL	ICESTL	105
AV94	MSTL053616	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SD1	79033110	L	0	TILDEN	IL	ICESTL	106
AV94	MSV 000316	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	8	PHILADELP	MI	ICESTL	107
AV94	MSV 000316	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	0	PHILADELP	MI	ICESTL	108
AV94	NATX029222	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	8	WOODSTOCK	TE	ICESTL	109
AV94	NATX029222	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	0	WOODSTOCK	TE	ICESTL	110
AV94	NATX076207	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TI	DEM376	79033113	E	8	TCLSON	IL	ICESTL	111
AV94	NATX076207	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	YD	TCUT31	79033110	E	0	TCLSON	IL	ICESTL	112
AV94	NATX076207	VLYJCI	ICG	YD	TCUT31	79033110	E	VLYJCI	ICG	TI	DEM376	79033113	E	0	TCLSON	IL	ICESTL	113
AV94	NATX076207	VLYJCI	ICG	TI	DEM376	79033113	E	VLYJCI	ICG	FI	DEM403	79040316	L	4	MEREDOSIA	IL	ICESTL	114
AV94	NW 071887	VLYJCI	ICG	TA	GV3	79033004	L	MADISI	ICG	ID	ITC	79040210	L	8	GRACITY	IL	ICESTL	115
AV94	NW 071887	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	YD	TCUT02	79040208	L	0	GRACITY	IL	ICESTL	116
AV94	NW 071887	VLYJCI	ICG	YD	TCUT02	79040208	L	MADISI	ICG	ID	ITC	79040210	L	0	GRACITY	IL	ICESTL	117
AV94	NW 172116	VLYJCI	ICG	TA	GV3	79033004	E	BADENN	NW	TD	S001	79040314	E	8	MOBERLY	MO	ICESTL	118
AV94	NW 172116	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	ID	TRRA	79040108	E	0	ESTLOUIS	IL	ICESTL	119
AV94	NW 172116	VLYJCT	TRRA	IR	ICG	79040108	E	BADENT	TRRA	ID	NW	79040213	E	0			ICESTL	120
AV94	NW 172116	BADENN	NW	IR	TRRA	79040213	E	BADENN	NW	TD	S001	79040314	E	0	MOBERLY	MO	ICESTL	121
AV94	NW 293321	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	8	NEWORLEAN	LA	ICESTL	122
AV94	NW 293321	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	0	NEWORLEAN	LA	ICESTL	123
AV94	NW 693548	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	8	NEWORLEAN	LA	ICESTL	124
AV94	NW 693548	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	0	NEWORLEAN	LA	ICESTL	125
AV94	NW 693567	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	8	NEWORLEAN	LA	ICESTL	126
AV94	NW 693567	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	0	NEWORLEAN	LA	ICESTL	127
AV94	OTTX090189	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM5	79033117	L	8	SAVANNAH	GA	ICESTL	128
AV94	OTTX090189	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM5	79033117	L	0	SAVANNAH	GA	ICESTL	129
AV94	PC 138286	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	8	MEMPHIS	TE	ICESTL	130
AV94	PC 138266	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	TD	SM5	79033117	E	0	MEMPHIS	TE	ICESTL	131
AV94	PC 578056	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	8	NEWORLEAN	LA	ICESTL	132
AV94	PC 578056	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	TD	SM3	79033103	L	0	NEWORLEAN	LA	ICESTL	133
AV94	PCB 889608	VLYJCI	ICG	TA	GV3	79033004	L	MADISI	ICG	ID	ITC	79040507	L	8	GRACITY	IL	ICESTL	134
AV94	PCB 889608	VLYJCI	ICG	TA	GV3	79033004	L	VLYJCI	ICG	BO	SHP030	79033023	L	0	GRACITY	IL	ICESTL	135
AV94	PCB 889608	VLYJCI	ICG	BO	SHP030	79033023	L	VLYJCI	ICG	OK	SHP006	79040216	L	0	GRACITY	IL	ICESTL	136
AV94	PCB 889608	VLYJCI	ICG	OK	SHP006	79040216	L	VLYJCI	ICG	YD	TCUT05	79040506	L	0	GRACITY	IL	ICESTL	137
AV94	PCB 889608	VLYJCI	ICG	YD	TCUT05	79040506	L	MADISI	ICG	ID	ITC	79040507	L	0	GRACITY	IL	ICESTL	138
AV94	PLMX010373	VLYJCI	ICG	TA	GV3	79033004	E	LINDNS	SLSF	TD	33	79040311	E	8	CARLSBAD	NM	ICESTL	139
AV94	PLMX010373	VLYJCI	ICG	TA	GV3	79033004	E	VLYJCI	ICG	ID	TRRA	79040108	E	0	CARLSBAD	NM	ICESTL	140
AV94	PLMX010373	VLYJCT	TRRA	IR	ICG	79040108	E	UNSTAT	TRRA	ID	SLSF	79040218	E	0			ICESTL	141
[illegible]	PL [illegible] 037.	[illegible] STA!	[illegible] SF	I [illegible]	[illegible] RA	[illegible] 040 [illegible]	E	L [illegible] S	S [illegible]	TD	[illegible]	[illegible] 0311	[illegible]	[illegible]	CA [illegible] AD	[illegible]	ICE [illegible]	14 [illegible]

The AAR data and all records for outbound trains of March 30 were reviewed and the volume of outbound traffic from local industry, CRIP, ITC and MRS were then used to supplement the outbound traffic from the inbound trains of March 30. The total number of individual block to block movements identified was 1,493.

3.1.2 Projections of Traffic Data to Horizon Years 1985 and 2000

Each railroad agreed that the best approach to splitting traffic for projections was to separate unit trains, TOFC traffic, and general freight traffic and apply individual projection factors to each. Projection factors could be applied to all inbound blocks. CONSAD and the RTAC jointly decided that each road probably had a better feel for inbound traffic and, hence, the projections were applied against inbound traffic. The cars projected in each inbound block were distributed to the appropriate block. The sum of all cars assigned to an outbound block was equal to the projected volume in that block.

Projected trains and blocks were sent to each road for review. Decisions as to how to handle increased traffic and adjustments required to rationalize each train were discussed with each road. Based upon these discussions, CONSAD finalized the inbound and outbound road traffic to be analyzed.

3.1.3 Assignment of 1985 and 2000 Year Traffic

In Phase I of the restructuring project, each road selected a pattern of operation within the restructured study area. Specifically, each road indicated at which yard their inbound trains would arrive and at which yard their outbound trains would depart. Each road was asked if they desired to change the pattern that was described in the Phase I report, and changes were made as requested.

Using the pattern of operation described in the Phase I report, CONSAD assigned each road train to a specific yard. After documenting the outbound blocks entering each common yard for each alternative, (No Build, Two-Yard Directional, Three-Yard Directional and Bidirectional) decisions as to which classifications must be built at each yard were made. Based on these classifications and the approximate time of day they would be ready, transfer movements between yards and to/from local industry were developed for each horizon year and each alternative.

The basic 1,493 block to block pairs were coded with transfer data for each alternative, and each pair contained volume information for the three years 1979, 1985, and 2000. This complete description of each pair moved through the study area formed the basis for much of the analytical work that followed, since this basic file could be sorted in many ways. Exhibit 3.3 shows the summary of these efforts -- the number of cars, the percentage of the total, and the percentage increase over the 1979 case.

3.1.4 TOFC Traffic Data

The AAR data does not include TOFC trailer/container data. Only the movement of the flat cars is recorded. CONSAD personnel visited each TOFC ramp location in the study area shortly after March 30, and manually collected complete data on all trailer moves for the study day. These data were tabulated, projected, and reviewed with RTAC and local TOFC representatives in much the same way as train and car data.

The multiple sources of data, checked with one another and reviewed with RTAC members, insured the high quality of the data.

Exhibit 3.3: Cars Entering Study Area In A Day

	1979		1985		2000	
	# of Cars	% of Total	# of Cars	% of Total	# of Cars	% of Total
In Through Trains	590	7	660	6	1,070	6
% Increase Over 1979				+12		+81
In Unit Trains	1,480	16	2,030	19	4,870	29
% Increase Over 1979				+37		+229
Subtotal (not switched)	2,070	23	2,690	25	5,940	35
% Increase Over 1979				+30		+187
In Trains To/From Local Industry	970	11	1,130	10	1,650	10
% Increase Over 1979				+16		+70
In Trains to be Handled and Forwarded	5,960	66	6,790	63	9,370	55
% Increase Over 1979				+14		+57
Subtotal (Switched)	6,930	77	7,920	73	11,020	65
% Increase Over 1979				+14		+59
TOTAL	9,000	100	10,610	100	16,960	100
% Increase Over 1979				+18		+88

3.2 Definition of Measures of Effectiveness

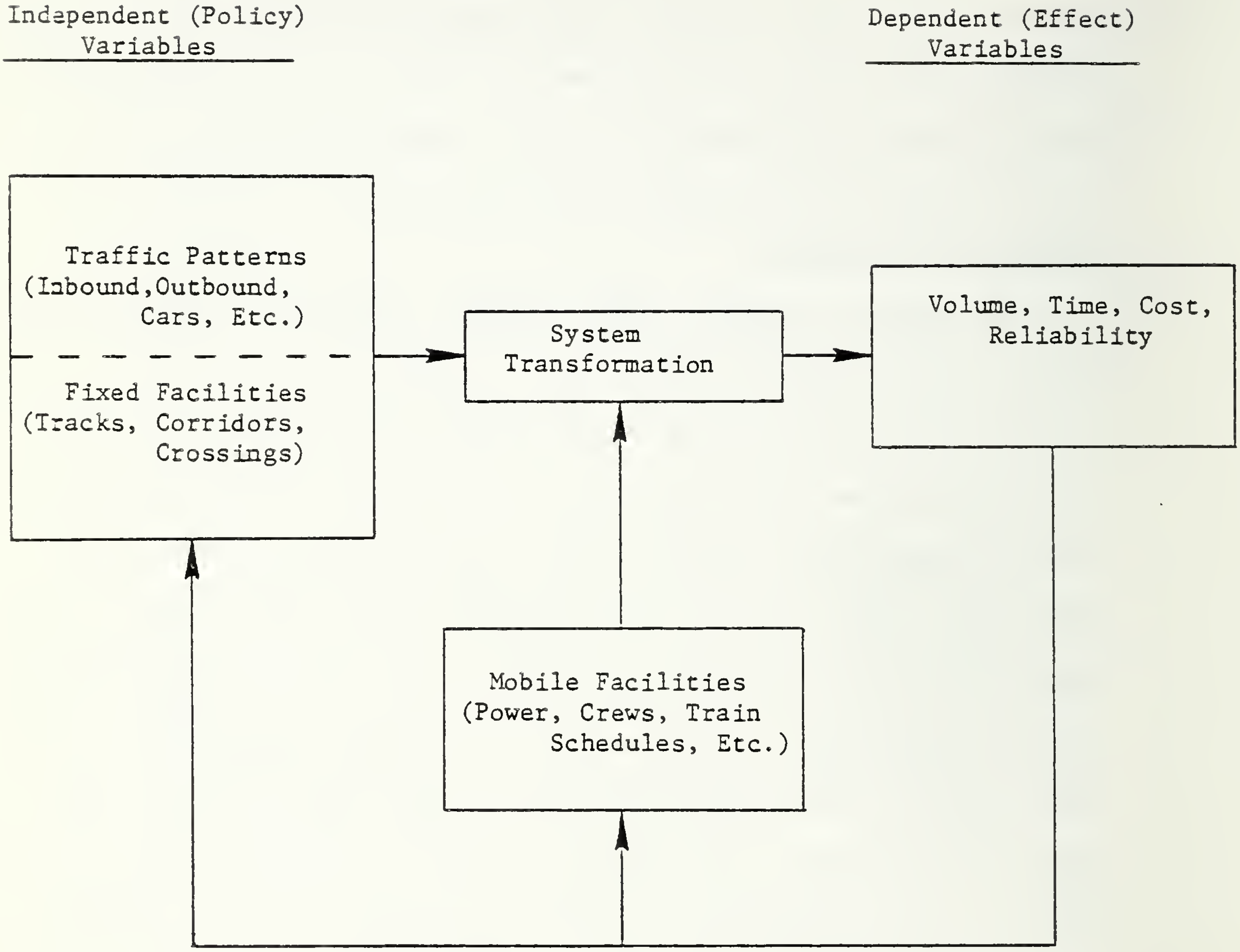
The railroad operations component of the railroad restructuring project involves the analysis of four basic alternatives under the same overall traffic loads. The assessment of these four basic alternatives can be viewed as an estimation of certain "measures of effectiveness" which represent the operation of the terminal, as a whole, and of the components of interest.

The system of interest can be viewed in the sense of systems analysis as depicted in Exhibit 3.4.

The sets of input to the system (independent or policy variables) are of three types. The first of these is the set of fixed facilities and fixed operational practices which exist within the bounds of the study area. These include trackage and other such fixed aspects of the yards and corridors throughout the study area. The second input set is the mobile facilities which operate over the fixed facilities to process traffic. These include locomotives, crews, train schedules and other such resources. The third set of inputs cover the traffic movements, in cars which enter and exit the study area throughout a given period of time (one day).

The dependent variables (measures of effectiveness) are the means by which the performance of the system was assessed for evaluation. These are the measures of the "goodness" of system performance under the sets of policy variables which describe the system. The measures of effectiveness are the result of all three sets of policy variables as they are interrelated and transformed by the system and its components.

Exhibit 3.4: Input/Output Relationships in Study Area


Independent (Policy) Variables
Dependent (Effect) Variables
Traffic Patterns (Inbound, Outbound, Cars, Etc.)
Fixed Facilities (Tracks, Corridors, Crossings)
System Transformation
Volume, Time, Cost, Reliability
Mobile Facilities (Power, Crews, Train Schedules, Etc.)

It was useful to postulate very general relationships between policy and effect variables. The assessment of system performance involves measurement of these effects under variation in the policy variables. It was not sufficient to solely assess the system as a whole. Through the course of this analysis, the performance of subsystems was also measured. The most fundamental disaggregation of the total system was by: 1) yards; and 2) corridors. Each of these was thought of as a subsystem. These two functional categories were further partitioned into smaller subsystems. Exhibit 3.5 is a schematic of the study area showing the common yards and corridors of interest. The following components were defined for analysis and evaluation.

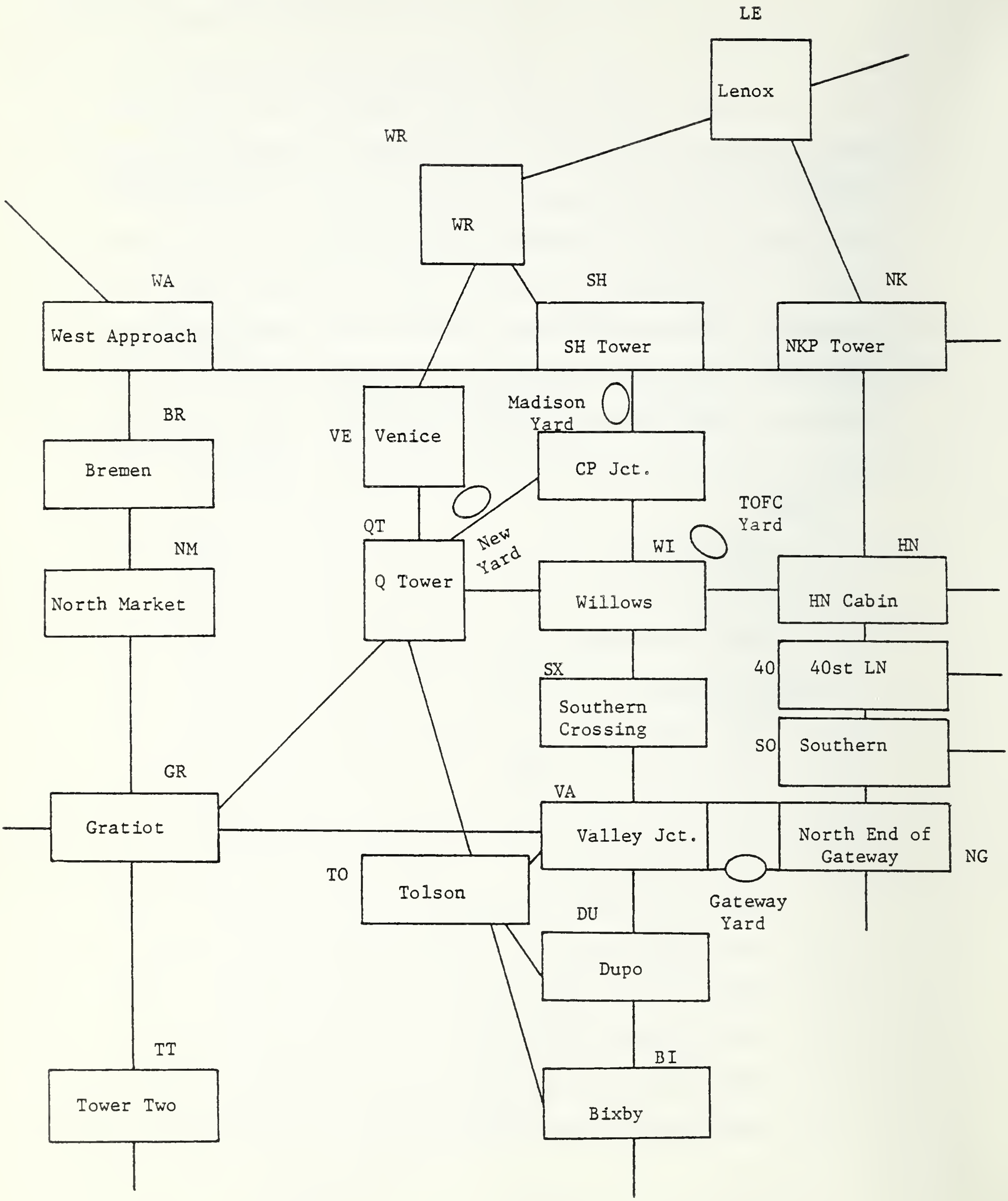
Yards

1. Madison (SH-CP)
2. Gateway (NG-VA)
3. New Yard (CP-QT)

Corridor Segments

1. LE-WR (Lenox - WR)
2. LE-NK (Lenox - NKP Tower)
3. WR-VE (WR - Venice)
4. WR-SH (WR - SH Tower)
5. WA-BR (West Approach - Bremen)
6. WA-SH (West Approach - SH Tower)
7. SH-CP (SH Tower - CP Junction)
8. SH-NK (SH Tower - NKP Tower)
9. NK-HN (NKP Tower - HN Cabin)
10. BR-NM (Bremen - North Market)

Exhibit 3.5: Schematic of St. Louis Gateway



11. VE-QT (Venice - Q Tower)

12. CP-QT (CP Junction - Q Tower)

13. CP-WI (CP Junction - Willows)

14. NM-GR (North Market - Gratiot)

15. QT-GR (Q Tower - Tolson)

17. QT-WI (Q Tower - Willows)

18. WI-SX (Willows - Southern Crossing)

19. WI-HN (Willows - HN Cabin)

20. HN-40 (HN Cabin - 40 St. LN Crossing)

21. 40-SO (40 St. LN Crossing - Southern Junction)

22. SX-VA (Southern Crossing - Valley Junction)

23. SO-NG (Southern Junction - North End of Gateway Yard)

24. GR-TT (Gratiot - Tower Two)

25. GR-VA (Gratiot - Valley Junction)

26. VA-TO (Valley Junction - Tolson)

27. VA-DU (Valley Junction - Dupo)

28. VA-NG (Valley Junction - North End of Gateway Yard)

29. TO-BI (Tolson - Bixby)

30. TO-DU (Tolson - Dupo)

31. DU-BI (Dupo - Bixby)

The above 31 elements comprised the system analyzed under the following alternatives:

Traffic Levels and Patterns	Alternative
1. 1979	No Build
2. 1985	No Build

Traffic Levels and Patterns	Alternative
3. 2000	No Build
4. 1985	Two-Yard Directional
5. 2000	Two-Yard Directional
6. 1985	Three-Yard Directional
7. 2000	Three-Yard Directional
8. 1985	Three-Yard Bidirectional
9. 2000	Three-Yard Bidirectional

For each of these elements under each traffic level and alternative, certain measures of effectiveness were calculated. It is the estimation of the effectiveness which was the focus of the operations analysis. The results of the operations analysis were structured to facilitate formation into these measures of effectiveness.

3.2.1 Corridor Analysis

For the corridor analysis, two types of summaries are of interest for evaluation. The first of these shows the performance of each corridor segment and of the total of corridor segments which can be called the "corridor subsystem". Appendix C contains these tables. The first four columns of these tables are input, although the number of trains and cars which traverse a corridor segment over the simulation period (24 hours) could have varied depending upon performance of the segment and its ability to process all of the trains scheduled. The critical result of the corridor analysis is shown in the fifth (travel time) and sixth (delay time) columns. The remaining columns show the production units resulting from the corridor operations (gross ton miles, car hours and train miles). Exhibit 3.6 and 3.7 show summary information regarding the corridor operation by link and by road, and Exhibit 3.8 shows the overall average by alternative and year.

3.2.2 Yard Analysis

The same principles of assessment pertained to yard analysis, although the operations in yards and the factors involved in yard analysis are different from corridor analysis. The fundamental measures of effectiveness of yard operations are the following:

- Volume;
- Speed; and
- Cost.

The factor of time spent in yard operations by rail cars is called detention time.

Under a broad definition of detention time, the following components of time were identified:

- Receiving delay;
- Yarding time;
- Inspection delay;
- Inspection/brake-bleeding time;
- Switching delay;
- Switching time;
- Reswitching time;
- Accumulative time;
- Departure pull delay;
- Departure pull time;

Exhibit 3.6: Average Speed of Trains by Link by Alternative and Year (Miles Per Hour)

		No Build		Two-Yard Directional		Three-Yard Directional		Three-Yard Bidirectional	
Link	1979	1985	2000	1985	2000	1985	2000	1985	2000
1	17.6	16.2	15.8	34.0	32.4	34.0	32.4	34.0	32.4
2	7.7	14.6	14.4	24.3	26.6	27.9	27.9	19.9	20.0
3	10.5	11.2	10.9	39.0	36.3	28.7	29.2	31.0	31.2
4	5.8	6.1	5.9	13.2	11.7	9.0	10.6	16.1	15.2
5	3.4	2.1	2.0	10.4	11.6	8.7	8.6	5.6	6.7
6	6.3	4.9	3.9	15.7	17.2	19.9	18.9	12.1	11.7
7	5.0	4.7	4.5	13.3	13.5	10.7	10.7	6.4	6.9
8	NA	NA	NA	NA	NA	NA	NA	28.0	28.0
9	5.7	4.9	4.4	25.9	26.3	30.3	23.7	41.2	39.7
10	5.6	4.6	4.7	22.0	20.3	22.3	21.3	14.5	14.1
11	4.9	4.5	4.5	21.9	19.9	14.2	14.3	22.2	21.8
12	0	12.0	12.0	NA	NA	NA	NA	NA	NA
13	5.2	3.8	3.8	13.5	14.0	19.6	19.6	17.6	17.6
14	9.1	9.1	9.0	22.6	22.7	26.6	25.1	25.9	26.4
15	4.7	4.7	5.3	10.5	10.5	9.1	9.5	8.5	7.0
17	10.0	8.4	8.5	16.7	17.4	9.7	5.7	15.5	13.0
18	9.5	8.3	8.3	10.2	10.9	12.1	12.1	12.3	12.3
19	10.6	12.4	11.6	33.0	33.0	33.0	33.0	27.2	27.5
20	4.7	4.0	4.0	26.4	26.5	31.1	30.6	30.3	30.0
21	3.9	3.2	3.2	30.6	28.4	30.6	28.4	30.6	28.4
22	4.7	4.0	4.0	7.5	7.9	8.9	8.9	9.0	9.0
23	1.0	1.0	0.8	4.7	3.8	3.7	3.2	4.2	3.0
24	7.0	6.8	7.4	17.6	17.4	20.2	18.9	15.7	15.0
25	5.9	5.6	6.1	16.4	14.5	15.3	11.4	16.6	14.0
26	9.2	5.5	5.5	10.3	10.3	9.6	9.6		
27	15.0	9.3	9.9	28.3	29.9	33.6	32.8	32.7	32.8
29	17.2	14.7	14.7	38.6	38.6	38.6	38.6	38.6	38.6
30	9.7	9.7	9.7	31.5	31.5	23.6	23.6	NA	NA
31	14.2	13.2	13.6	21.8	22.3	21.5	21.3	25.3	24.9
33	5.0	5.1	5.2	12.9	11.8	10.4	10.8	9.7	8.6
34	7.5	6.6	6.5	18.0	17.2	13.9	12.2	13.5	13.4
35	4.6	4.7	3.9	34.1	32.4	34.1	32.4	34.1	32.4
42	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0

NA = Not Applicable

Exhibit 3.7: Average Speed of Trains by Road by Alternative and Year

Road	1979	No Build 1985	No Build 2000	Two-Yard Directional 1985	Two-Yard Directional 2000	Three-Yard Directional 1985	Three-Yard Directional 2000	Three-Yard Bidirectional 1985	Three-Yard Bidirectional 2000
Alton & Southern	5.0	4.7	4.5	19.2	17.7	16.2	16.2	17.0	17.0
Amtrak	13.6	19.2	17.2	34.7	34.7	33.4	36.0	30.2	31.2
Burlington Northern	6.6	5.5	5.5	26.0	27.3	28.4	18.4	28.4	28.4
Baltimore & Ohio (Chessie)	5.7	4.4	4.9	21.7	24.3	18.8	15.3	20.4	19.5
Conrail	7.0	5.8	5.7	26.7	27.4	21.3	17.9	23.1	21.2
Chicago & North Western	5.8	4.7	4.5	20.8	22.4	27.0	23.4	29.0	29.8
Illinois Central Gulf	9.5	8.3	8.9	25.3	24.9	19.7	19.1	21.9	21.2
Illinois Terminal	5.7	4.1	4.6	19.1	19.1	22.0	22.0	20.6	22.7
Missouri-Kansas-Texas	0.0	0.0	0.0	20.2	20.2	12.1	12.1	18.3	17.1
Louisville & Nashville	3.4	3.0	3.0	16.2	16.2	19.3	10.4	24.9	24.9
Missouri Pacific	10.8	9.4	9.5	21.8	22.0	25.1	23.7	23.1	22.0
Manufacturers	7.1	9.2	9.2	14.9	17.3	19.7	19.7	21.1	16.9
Norfolk & Western	7.1	6.3	6.0	29.7	29.7	26.7	25.8	28.2	28.1
New Yard	0.0	0.0	0.0	0.0	0.0	12.1	11.2	14.5	14.5
Chicago, Rock Island & Pacific	0.0	0.0	0.0	16.0	16.0	16.0	16.0	5.3	3.2
St. Louis - San Francisco	6.2	5.0	5.3	18.1	15.9	14.4	10.3	14.0	14.2
Southern	8.0	3.4	4.5	12.1	15.8	8.9	16.1	13.3	16.7
St. Louis Southwestern	16.2	7.5	7.6	29.1	29.7	31.9	29.1	27.8	28.0
TOFC	0.0	0.0	0.0	16.7	16.7	20.3	20.7	18.5	19.4
Terminal Railroad Association	5.9	5.0	4.5	17.1	18.3	14.0	14.5	15.2	14.3

Exhibit 3.8: Average Corridor Speeds (Miles Per Hour)

	1979	1985	2000
No Build	7.6	6.5	6.6
Two-Yard Directional		22.7	22.7
Three-Yard Directional		21.4	20.1
Three-Yard Bidirectional		21.9	21.4

- Train - preparation delay;
- Outbound - train preparation;
- Departure time; and
- Special car handling.

This list accounts for all of the time that freight cars spend in passing through a classification yard from the point at which they enter the yard system on an inbound train until they depart on an outbound train. The point of entry is either the physical boundary of the yard or the point of the inbound mainline at which the train is "available for entry".

For purposes of our analysis and assessment, a smaller set of time factors is preferable. This is shown in Exhibit 3.9.

In order to compute these time elements, a computer program, described in Section 3.3.1, was used. Summaries of the information required were made on the following groupings:

- Outbound train;
- Inbound train;
- Outbound carrier;
- Inbound carrier; and
- Time of day interval.

In all cases, the data were summarized on the basis of individual cars. The time elements for each block were multiplied by the number of cars in the block to get car-minutes. Dividing by the total number of cars in each grouping produced car-minutes per car which is the average time that a car spends in each time element. Appendix B shows the summary tables.

Exhibit 3.9: Definitions of Key Events in Classification Yards

Name of Event	Event Symbol	Time Element	Element Symbol	
Time of Arrival at Yard	TAY			
		Hold-Out Time	HT	Detention Time
Time of Arrival at Receiving Track	TAR			
		Yarding Time	YT	
Time of Departure from Receiving Track	TDR			
		Switching Time	ST	
Time of Arrival at Classification Track	TAC			
Time of Departure from Classification Track	TDC			
		Make-Up Time	MT	
Time Ready to Depart from Departure Track	TRD			
		Schedule Slack	SS	
Time of Departure on Outbound Train	TDO			

where:

Hold-Out Time HT=TAR-TAY

Yarding Time YT=TDR-TAR

Switching Time ST=TDC-TDR

Make-Up Time MT=TRD-TDC

= departure pull delay DPD

+ departure pull time DPT

+ train preparation delay TPD

+ outbound train preparation OTP

= DPD+DPT+TPD+OTP

Schedule Slack SS = TDO-TRD

DT = TRD-TAR

They provide measures of average times by train and for the yard as a whole. These average times were the key to evaluation of yard performance and to adjustment of impacts so as to achieve efficient yard operations. These summary tables were prepared for each yard under analysis (Madison, Gateway and New Yard) under each set of inputs (year and configuration).

In addition to these measures of performance in terms of time, the yard costing methodology requires additional data, mostly resource data, which was available as input to the yard model.

3.2.3 System Evaluation

In addition to evaluation of the components of the study area, measures of effectiveness of the entire study area are of interest. The information developed in the corridor and yard analysis was combined to develop these system measures.

The central measures for this system-level evaluation are the time, cost, and reliability involved with traffic making the full move through the study area, both for through-traffic and for traffic originating in or destined for the St. Louis area.

CONSAD utilized average performance measures for each component of the system over which a block of traffic moves. A block which used corridors i, j and k and is switched at yard x_1 and yard x_2 had assigned to it the average performance characteristics of corridors i, j and k and of yards x_1 and x_2. Then traffic of interest and associated performance characteristics was accumulated, so as to obtain system-level measures of performance. At each level, the total times and costs involved were divided by the appropriate number of cars to get unit measures of system performance.

3.3 Operations Analysis Methods

The initial focus of CONSAD's work was an analysis of railroad operations within the study area, both as they are at the present time and as they would be in the future under any one of the four proposed alternatives for the restructuring of the physical facilities and operating patterns in the area. The purposes of these operations analyses were:

1) To furnish information useful in the refinement of the design of specific physical facilities (i.e., common yards and the corridor network) under the various restructuring alternatives; and

2) To provide comprehensive operating data, concerned with railroad operations under these restructuring alternatives in two future years (1985 and 2000), once the detailed physical characteristics of the various restructuring alternatives were established. These data would be employed in the development of measures of operational and cost-effectiveness of the alternative restructuring plans relative to one another.

The operations in and around a large metropolitan railroad study area, such as St. Louis/East St. Louis, are varied and exceedingly complex, and it was not feasible to perform a detailed analysis of operations for such a system as a single entity. Because of this CONSAD chose to analyze railroad operations from the standpoint of the major operational components of the system, which were the corridor network, classification yards and intermodal facilities. The results of these detailed component or subsystem analyses were then summarized and merged to produce overall measures of the relative effectiveness of the system as a whole under each of the proposed restructuring alternatives.

These measures of effectiveness were discussed in the preceeding section and the methodologies employed in the development of specific measures of system effectiveness are described in subsequent sections (Sections 3.4 and 3.5). The results of the analyses of overall system effectiveness are presented in Section 4.

The following sections describe the analytical methods employed in the detailed operations analyses of the study area subsystems, including: input to the analyses, the basic mechanics of these analyses, and the general form, content, and relevance of the analytic results.

3.3.1 Yard Operations

In order to develop detailed operating data for the proposed yard facilities under future traffic loads, it was necessary to simulate the operations of these yards. Given the unique sets of projected conditions under which they would be required to function, the complexity of yard operations, and the fact that a large number of restructuring alternative/yard/year combinations were to be analyzed, it was determined that these simulations would necessitate the use of computer modeling techniques. Therefore, the first task in the analysis of yard operations was the selection of an appropriate classification yard simulation model.

Several computer models for the simulation of hump classification yards were examined, including:

- The USRA Model, developed to evaluate the system planning that preceded the reorganization of northeast railroads;

- The Conrail Classification Yard Simulation Model, which was an updated version of the USRA Model;

- The Stanford Research Institute Model, being developed for FRA, which was not yet available for use; and

- The YARDSIM Model, developed by Transportation and Distribution Associates and, although available for use, would have required resources unavailable to the project team.

The three primary criteria used in selecting a simulation model were: 1) availability for use; 2) applicability to the St. Louis Railroad Gateway Restructuring Project; and 3) demonstrated success in the use of the model. The Conrail Yard Model was the only model which met all of these criteria. In addition, CONSAD believed that developmental efforts undertaken by Conrail to improve the model made it the most useful model currently available for simulating classification yards. Hence, this was the model which was ultimately chosen for use in the restructuring study.

Conrail's Classification Yard Simulation Model was developed for the Consolidated Rail Corporation by Boeing Computer Services Company. This simulation model was adapted for use in the restructuring study by CONSAD and staff of the Illinois Department of Transportation, who made modifications to the model's output reports, to provide for the generation of more detailed and comprehensive operating data, and made certain other program changes to enable the basic model logic to deal with the "non-standard" (in the model's terms) configurations of yards in the study area. The model, after adaptation, provided a detailed representation of everyday hump yard operations and served as a valuable tool in the analysis, design and planning of the involved rail yards. In addition to generating data concerned with the nature and efficiency of movements of rail traffic through the yards under study, the model output furnished information useful for environmental impact analysis and operations costing of the various restructuring alternatives.

The Modeling Process

The Conrail Yard Model is an event-based simulation and was developed primarily to assist in the determination of the following factors concerning classification yard operations:

- Maximum traffic capacity of a particular yard given specified resources and work rates;
- Effect of variations in the levels of mobile resources (i.e., hump and trim engines, inspection crews; etc.);
- Impact of changes in blocking strategy;
- Effect of changes in fixed facilities (i.e., number and capacity of receiving, classification and departure tracks, number of hump leads, the addition or deletion of crossover switches in the pullout area, etc.); and
- The movement of specific groups of cars through the yard under various sets of circumstances as described above.

Therefore, once a base case has been established, the model allows for the evaluation of the comparative advantages and/or disadvantages of different options with respect to the physical configuration and operating policies of a particular rail yard.

Model Inputs

In order to simulate the operations of a particular yard a great deal of detailed information about the yard was input to the model. This model input fell into three basic categories: 1) physical configuration of the yard, 2) operational data, and 3) traffic data, all of which taken together formed the basis on which the model simulated the classification yard.

The information on the yard's physical configuration input to the model consisted of the following:

- The number and car capacity of individual receiving tracks;
- The number of hump leads;
- The number and car capacity of individual classification tracks;
- The number and car capacity of individual departure tracks; and
- Detailed description of the yard's "pullout area," including all relevant switches and crossovers, their lengths and distances between switches.

This information was assembled using scale "Working Drawings" of the yards supplied by SEK, revised with feedback from the model output.

Data supplied to the model concerning the basic operational parameters for a particular yard included the following:

- Amount of time required to complete certain repetitive tasks;
- Points in time when specific events occur in the yard;
- Personnel/equipment resources and their work schedules; and

- Descriptions of routes to be used by lite engines and trains when moving between different locations in the yard's pullout area.

The specific values assigned to these various parameters were averages based upon the physical characteristics of the yards and actual experience in the area's existing facilities.

The traffic data provided to the model were of two basic types: 1) the designation of the nature of the traffic to be handled on the various tracks within the yard, and 2) the actual make-up of the traffic to be processed in the yard.

The various subsystems of track in the yard (receiving, classification and departure) could be split directionally, Eastbound or Westbound, as to the type of traffic that was to be handled. Thus, one could have specified a yard in the model that would have separate Eastbound and Westbound receiving tracks, classification tracks and departure tracks. Classification tracks, in addition to being designated as Eastbound or Westbound, were optionally assigned specific classifications or destinations to be placed on these tracks (two per track, one certain and one conditional destination block).

The make-up of the traffic for a particular yard being simulated was input to the model in the form of a detailed description of all inbound and outbound trains. Information describing each inbound train consisted of the following:

- Train name;
- Train priority (high or low);

- Number of different destination blocks on the train;
- Name and number of cars for each destination block;
- Time specified for arrival;
- Assignment to receiving yard (East, West or either); and
- Assignment to hump lead (East Bowl or West Bowl), if applicable.

The information describing each outbound train included:

- Train name;
- Assignment to Eastbound or Westbound departure yard, if applicable;
- Scheduled departure;
- Name and sequential order of destination blocks or classifications to be placed on the train; and
- Estimated number of cars on the train.

The traffic data input to the yard model for this analysis represented the "typical heavy day" derived from the traffic data described in detail in Section 3.1 of this report. Each of 1,493 basic inbound train/block pairs were assigned to move between the various yards in the study area. These assignments resulted in the traffic for the model.

Model Mechanics

In general, the model simulates the complete range of daily hump yard activities including the following:

- The arrival and yarding of inbound trains at the receiving yard;
- Assignment of inbound inspection crews and the inspection of inbound trains;
- Humping of cuts of cars from the receiving yard;

- Classification of cars in the "bowl" of the yard;
- Rehumping and reclassification of cars placed on sluff and/or crossover tracks in the bowl;
- Pulling of cuts from the bowl to the departure yard (including the doubling of classification tracks);
- Building or make-up of outbound trains on departure tracks;
- Assignment of outbound inspection crews and the inspection of completed outbound trains;
- The departure of outbound trains from the yard;
- And finally, for all of the above activities, simulated conflicts which result from both the use of limited resources (i.e., track capacity, engines, crews, etc.) and the movement of trains in the yards' pullout areas.

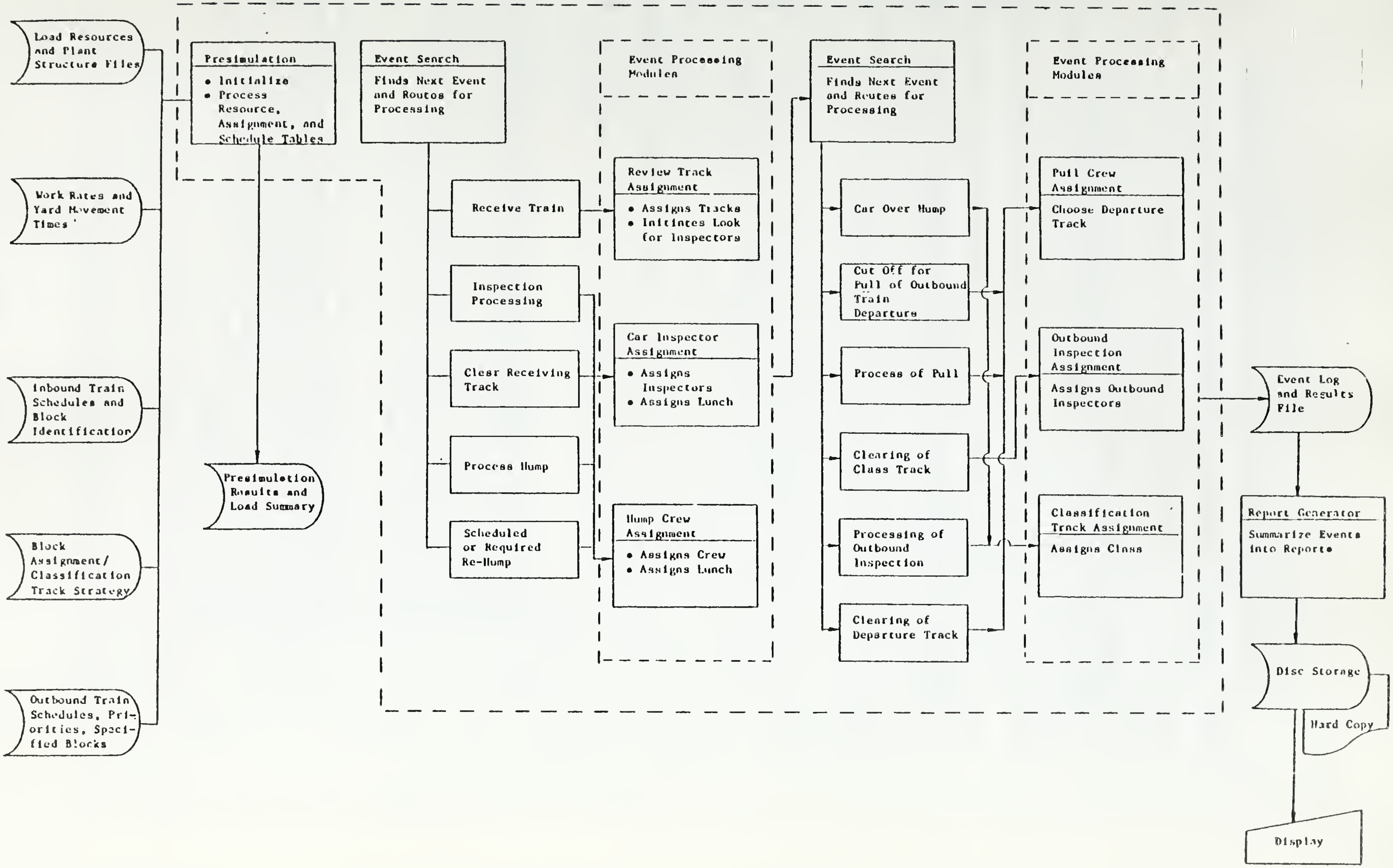
Exhibit 3.10 is a diagrammatic representation of the mechanical process employed by the model in the simulation of yard activities.

For further detail on this subject, the reader is referred to the users' manual and report, Classification Yard Simulation Model (developed for Consolidated Rail Corporation), by Joseph J. Supplee, Boeing Computer Services Company.

Model Output

From the simulation process, the model tabulates a great deal of detailed operating data and generates several summary reports as a part of its output. The most significant of these output reports are briefly described below.

Exhibit 3.10: Yard Simulation Model Process


Load Resources and Plant Structure Files
Work Rates and Yard Movement Times
Inbound Train Schedules and Block Identification
Block Assignment/ Classification Track Strategy
Outbound Train Schedules, Priorities, Specified Blocks
Presimulation
• Initialize
• Process Resource, Assignment, and Schedule Tables
Presimulation Results and Load Summary
Event Search
Finds Next Event and Routes for Processing
Receive Train
Inspection Processing
Clear Receiving Track
Process Hump
Scheduled or Required Re-Hump
Event Processing Modules
Review Track Assignment
• Assigns Tracks
• Initiates Look for Inspectors
Car Inspector Assignment
• Assigns Inspectors
• Assigns Lunch
Hump Crew Assignment
• Assigns Crew
• Assigns Lunch
Event Search
Finds Next Event and Routes for Processing
Car Over Hump
Cut Off for Pull of Outbound Train Departure
Process of Pull
Clearing of Class Track
Processing of Outbound Inspection
Clearing of Departure Track
Event Processing Modules
Pull Crew Assignment
Choose Departure Track
Outbound Inspection Assignment
Assigns Outbound Inspectors
Classification Track Assignment
Assigns Class
Event Log and Results File
Report Generator
Summarize Events into Reports
Disc Storage
Hard Copy
Display

The two reports of greatest interest were the Inbound and Outbound Train Histories, examples of which are shown in Exhibits 3.11 and 3.12 respectively. These reports provided important information regarding the movement of trains and/or blocks of cars into, through and out of the yard being simulated and served as a primary source of data for the analysis of yard operations. In these reports, all event times such as arrival time, actual departure, etc., were presented in the format of Day-Hour-Minute, while time intervals or elements such as receiving dealy, inspection time, etc., were given in minutes. For example, an arrival time of 52240 would indicate the fifth day, the twenty-second hour and the fortieth minute which is equivalent to 10:40 PM on day five of the simulation; whereas a receiving delay of 120 is one hundred and twenty minutes or two hours.

In addition to the two reports of primary interest, discussed above, the model provided a number of other useful output reports which included the following:

- Track Utilization Reports were produced for the yards' receiving, classification and departure tracks. These reports generally showed the occupancy and/or utilization of individual yard tracks during the final simulation day and were particularly useful as an aid in designing yard trackage.

- Hump Utilization Reports showed the number and make-up of the cars that had gone over the hump(s) on the last simulation day and calculated the number of minutes and the percentage of time the hump(s) were actually in use. These reports were of value in determining reasonable car volumes for yards and helped to identify periods of peak demand or congestion.

Exhibit 3.11: Sample Inbound Train History Report

NO.	TRAIN	NO. CARS	ARR TIME	REC DELAY	REC TRACK	REC TIME	INSP CREW	INSP DELAY	START INSP TIME	INSP TIME	READY TO HUMP	QUE TIME TO HUMP	START HUMP	HUMP TIME	END HUMP
1	SG20	52	50020	0	18	50049	3	0	50049	63	50152	15	50213	13	50226
2	-S06	40	50113	0	4	50141	1	0	50141	53	50234	51	50331	10	50341
3	LG92*	100	50200	0	13	50238	1	0	50258	103	50441	5	50451	25	50516
43	LG92*	60	50230	0	14	50318	2	0	50338	70	50448	38	50532	15	50547
4	L002	112	50252	0	9	50326	3	0	50326	113	50519	27	50552	28	50620
5	S001	109	50306	20	8	50400	4	34	50435	110	50625	15	50646	27	50713
6	4E02	8	50409	0	6	50434	2	13	50448	26	50515	5	50525	2	50527
7	-S02	88	50412	4	18	50448	2	26	50515	93	50648	24	50718	22	50740
8	4S04	24	50433	1	5	50501	1	15	50516	40	50556	28	50630	6	50636
9	XS01	113	50439	9	21	50522	3	31	50554	114	50748	57	50851	28	50919
10	4G02	99	50452	9	7	50534	1	21	50556	102	50739	5	50749	24	50813
11	XS30	16	50530	0	17	50556	4	29	50625	33	50659	74	50818	4	50822
12	XD01	73	50536	0	16	50607	4	52	50659	80	50820	79	50944	18	51002
13	X005	10	50543	13	15	50622	5	37	50700	28	50728	65	50838	2	50841
14	-S04	115	50714	0	9	50748	5	0	50748	115	50944	18	51007	28	51036
15	4004	103	50715	15	8	50803	6	0	50803	105	50949	62	51056	25	51122
16	7G25	48	50735	13	6	50817	7	0	50817	60	50917	5	50927	12	50939
17	2G11	40	50820	0	18	50848	8	0	50848	53	50941	54	51041	10	51051
18	XG03	85	50923	0	17	50955	5	0	50955	90	51125	16	51147	21	51208
19	MG24	19	51020	0	18	51046	6	0	51046	35	51122	5	51132	4	51137
20	XS05	93	51132	0	18	51204	5	0	51204	97	51342	6	51353	23	51417
21	SG12	42	51145	19	6	51233	6	0	51233	55	51328	5	51338	10	51348
22	LR04	115	51206	6	21	51246	7	0	51246	115	51442	5	51452	28	51521
23	X007	109	51237	0	9	51311	8	0	51311	110	51501	20	51526	27	51553
24	PG18	38	51240	6	5	51314	6	13	51328	51	51419	5	51429	9	51439
25	XS07	57	51311	0	17	51340	5	1	51342	67	51449	63	51558	14	51612
26	VS09	78	51410	0	18	51441	7	1	51442	85	51607	10	51622	19	51642
27	XS11	71	51419	22	16	51512	8	0	51512	79	51631	23	51700	17	51717
28	X009	45	51434	26	6	51528	9	0	51528	57	51626	12	51643	11	51655
29	L092	0	51439	33	5	51537	10	0	51537	20	51557	5	51607	0	51607
30	XS13	50	51536	0	17	51605	10	0	51605	61	51706	76	51828	12	51841
31	4E04	24	51541	0	15	51608	11	0	51608	40	51648	75	51808	6	51814
32	XS09	45	51616	0	5	51644	9	0	51644	57	51742	5	51752	11	51803
33	X013	29	51635	9	18	51712	10	0	51712	44	51756	49	51851	7	51858
34	LR02	94	51707	5	16	51745	9	0	51745	98	51923	5	51933	23	51956
35	LS06	116	51716	29	9	51819	10	0	51819	116	52016	5	52026	29	52055
36	LG04	141	51757	22	12	51856	11	0	51856	137	52113	5	52123	35	52159
37	XD15	60	51800	56	18	51926	12	0	51926	70	52036	18	52100	15	52115
38	2G24	65	51916	10	17	51956	9	1	51958	74	52112	46	52204	16	52220
39	4R04	39	52040	0	6	52108	10	0	52108	52	52200	19	52225	9	52235
40	XS72	0	52138	0	18	52203	9	0	52203	20	52223	12	52240	0	52240
41	VG22	80	52340	0	6	60011	1	0	60011	86	60138	5	60148	20	60208
42	VG23	63	52350	10	5	60030	2	0	60030	72	60142	77	60305	15	60321
		=====		====				====		=====		=====		=====	
		2767		345				274		3149		1199		680	

(*)- INDICATES THESE TRAINS WERE DOUBLED ONTO RECEIVING TRACKS

Exhibit 3.12: Sample Outbound Train History Report

```
                         **** OUTBOUND TRAIN HISTORY REPORT ****

               CLASS           DEP  ENGINE  START    END    NO  TOTAL  INSP  START    END  SCHEDULE  POWER  ACTUAL
TRAIN   BLOCK  TRACK  START  TRACK          PULL   PULL  CARS   CARS  CREW   INSP   INSP    DEPART  DELAY  DEPART

DX059   MPNO       5  42115      1      60  42115  42304    33
                   3                                        50
                                                                   83    43  42344  50123     50215  50215   50215
G7228   ITC       49  42130      4      40  42130  42215    25
                                                                   25    33  42255  42345     50230  50230   50230
R4058   CREN      50  42225      1      41  42225  50048    13
                  48                                        38
                  60                                        41
                                                                   92    25  50128  50315     50325  50325   50325
GP229   MPS       18  42230      4      52  42317  50104    18
                   6                                        50
                                                                   68    43  50144  50311     50330  50330   50330
GL039   NHDT      23  42230     10      53  42335  50015    19
GL039   NWCH      22  42230     10      53  50015  50104    32
                                                                   51    44  50144  50257     50330  50330   50330
G2269   MPW       14  42230     11      54  50005  50209    28
                  26                                        33
                                                                   61    45  50249  50410     50330  50330   50410
G4918   DOT       65  42258      5      42  42258  50115     9
                  39                                        50
                                                                   59    27  50155  50314     50358  50358   50358
G5018   CHVD      43  42300      7      34  42307  50054    33
                  35                                        41
                                                                   74    26  50134  50306     50400  50400   50400
R4079   CRAN      63  42302      9      34  50054  50432    38
                  54                                        46
                  42                                         9
R4078   CRAN      64  42302      9      35  50100  50223    32
R4078   CRAN      42  42302      8      34  50432  50545    45
                                                                  170    27  50625  50917     50402  50402   50917
GV279   IC        10  50015     12      52  50104  50214    21
                                                                   21    44  50257  50344     50515  50515   50515
S-919   SCCG      49  50100      2      36  50126  50305     7
                  34                                        41
S-919   SCCI      33  50100      2      35  50223  50329     4
                                                                   52    25  50409  50522     50600  50600   50600
DX989   MPAR      17  50225      8      52  50225  50324    12
DX989   MPCH      20  50225      8      53  50225  50349    21
                                                                   33    43  50429  50526     50725  50725   50725
DX109   MPDA       7  50235      1      54  50235  50448    23
                  16                                        44
                                                                   67    43  50528  50654     50735  50735   50735
GA089   ASI       40  50420      1      35  50420  50507    30
                                                                   30    25  50547  50642     50920  50920   50920
GC308   CAVE      66  50440      3      36  50440  50520    13
                                                                   13    26  50600  50641     50940  50940   50940
```

- Crew Utilization Reports were given for hump engine, pull engine, inbound inspection, and outbound inspection crews. These reports presented a listing of the time spent by each crew/engine in performing work related to specific trains, summarized the number of service and idle minutes for each crew during its shift on the last simulation day, and calculated a percent utilization for individual crews. This information was helpful in estimating the most effective levels of personnel and equipment resources for operation of particular yards, given their traffic bases.

- General Yard Performance Summaries consist of a frequency distribution of cars transiting the yard in a certain number of hours during the final simulation day, the age of cars left in the yard at the end of the simulation, the average elapsed yard time for cars dispatched from the yard on the last day, a listing of trains waiting to enter the yard, etc. Unfortunately, these reports did not provide information at the level of detail required by the restructuring study. A discussion of how this problem was overcome is presented in the subsection, Analytical Procedures.

The model generates a number of output reports other than those presented here. These reports contain information which is helpful in identifying very specific problems with simulation of a yard, and will not be discussed further at this time. If additional information concerning the output of the model is desired, the reader is again referred to the Conrail Yard Model's Users' manual. (A copy of this document is available for inspection at the East St. Louis MARGE offices, 325 Missouri Avenue, East St. Louis, IL).

It is important, at this point, to distinguish between an analysis of the operation of a yard on a particular day and the operation of the yard on a day as depicted by the output of the yard simulation model. The performance of a yard on a particular day is the result of (1) the traffic in the yard at the start of the study day, say 1201 AM, (2) the personnel and equipment resources used during the day, (3) the operating strategies applied during the day, (4) the "job-time" parameters on that day as distinguished from the "job-time" parameters on any other day, and (5) the traffic input to the yard. This combination of variable factors results in the operations for the day, which may be interrupted by unforeseen occurrences, such as derailment, engine failure, and bad order cars in outbound trains. Thus, each day of operation in a yard is somewhat different from each other day of operation.

The computer model addressed itself to these five considerations by (1) starting with an empty yard, (2) using the same levels of personnel and equipment resources each day, (3) using a specific set of operating rules (algorithms) for decisions as to how to allocate tracks and crews to do various jobs, (4) assuming the same "job-time" parameters for each day, and (5) repeating the same traffic input for each day.

These simplifying assumptions caused the model's simulations of yard operations to be somewhat different from actual yard operations. However, the primary objective in the yard component of the study was to be able to compare the relative performance of several alternative yards under current and projected traffic loads and operating conditions. In order to properly conduct this analysis, the analytical procedures applied to all restructuring alternatives had to be completely consistent. The use of the Yard Model was the only way in which to achieve such consistency. Although the model's simulation of operations was not an exact representation of reality, the simulation results do provide a reasonable and consistent basis for evaluating the relative performance of the yards under the various restructuring alternatives.

Analytical Procedures

Having described the processes involved in the modeling of rail yard operations, it is now possible to discuss the procedures developed to further analyze the operating data acquired from the modeling process.

The total amount of time rail cars spend in yard processing, commonly termed total detention time, is generally considered to be a fundamental factor related to the overall effectiveness of yard operations.* Unfortunately, the Conrail Yard Model provides only very general information concerning car detention time in the simulated yards. Because of the importance of total detention time as an indicator of yard operational effectiveness, it was decided that yard performance should be examined in greater depth by making determinations as to what portion of a car's total detention time was spent in major elements of classification yard operations. Due to the desire to provide data on yard performance specific to each of the participating railroads, it was felt that summaries of several groupings of this data (i.e., inbound and outbound carrier, inbound and outbound train, etc.), not explicitly provided in the model output, would make a significant contribution to the analysis. In order to achieve these two objectives, the following analytical procedures were developed.

---

*For the purposes of this analysis, total detention time of a rail car in a yard is defined as the amount of time which elapses between the arrival of that car at the perimeter of the yard on an inbound train and the departure of that same car from the yard on an outbound train.

CONSAD identified five major components or "time elements" involved in the movement of rail cars into, through, and out of classification yards. These elements are, in order of their occurrence:

- Hold-Out Time -- the amount of time a car is held out of the yard on a mainline before it is moved to a receiving track;
- Yarding Time -- the amount of time required to complete the task of receiving the car and preparing it for humping. This includes: time needed to place the car on a receiving track, inbound inspection delay, inbound inspection time and the movement of the car to the apex of the hump from the receiving track;
- Switching Time -- the amount of time involved in classification of cars in the "bowl" of the yard. This includes: humping of cars (i.e., shove over the apex), placement on classification tracks and the time spent on a classification track prior to being moved for departure on an outbound train;
- Make-Up Time -- the amount of time required to place a car on a departure track and ready it for departure on an outbound train. This includes the time involved in pulling a car from a classification track to a departure track, outbound inspection delay, outbound inspection time and air test time; and
- Schedule Slack -- the period between the time a car is ready to depart on an outbound train and the time of actual departure.

The five elements effectively account for all of the time rail cars spend in classification yard operations, from the time they arrive at the yard on an inbound train to the time they depart the yard on an outbound train. Therefore, by definition, the sum of these time elements is equivalent to Total Detention Time.

In order to determine time values for the various time elements, it was necessary to define the bounds of these components of yard operations. Because the Conrail Yard Model was an event-based simulation, the definitions of these elements were based on the time of occurrence of certain significant events in the movement of cars through a yard. Exhibit 3.13 shows the time elements, their related events and the general relationships between them.

Once the times at which the various operational events in a yard occurred for a car or group of cars were determined, it became possible to calculate values for the five time elements based on the relationships outlined in Exhibit 3.13. All time elements for individual cars or groups of cars were calculated in hours and then multiplied by the number of cars involved to yield car hours. Having done this for all cars which transit a yard on the study day, these results were then summarized in several ways, grouping the cars in the manner desired (i.e., by carrier, train, etc.), by summing the amount of car time for the various time elements associated with these cars and then dividing by the total number of cars in the particular group to obtain the average time spent by each of these cars in car hours per car. These average times served as an important aspect of the evaluation of yard performance and subsequent adjustment of yard configuration and/or operations so as to achieve efficient yard operation.

The information required to perform the basic analysis, namely the relevant event times, were acquired from the Inbound and Outbound Train History Reports provided by the model. The event times provided in these output reports were reviewed and those which most closely conformed to the events which define the five time elements, as discussed above, were selected. They provided the basis on which to calculate the specific time elements for the cars transiting the simulated yards.

Exhibit 3.13: Time Elements and Related Events

Time Element	Related Events	Relationship
Hold-Out Time (HT)	Time of Arrival at Yard on Inbound Train (TAY) Time of Arrival at Receiving Track (TAR)	HT = TAR - TAY
Yarding Time (YT)	Time of Arrival at Receiving Track (TAR) Time of Departure from Receiving Track (TDR)	YT = TDR - TAR
Switching Time (ST)	Time of Departure from Receiving Track (TDR) Time of Departure from Classification Track (TDC)	ST = TDC - TDR
Make-up Time (MT)	Time of Departure from Classification Track (TDC) Time Ready to Depart on Outbound Train (TRD)	MT = TRD - TDC
Schedule Slack (SS)	Time Ready to Depart on Outbound Train (TRD) Time of Departure on Outbound Train (TDO)	SS = TDO - TRD
Total Detention Time (TDT)	Time of Arrival at Yard on Inbound Train (TAY) Time of Departure on Outbound Train (TDO)	TDT = TDO - TAY or TDT = HT + YT + ST + MT + SS

Exhibit 3.14 lists the relevant events outlined in Exhibit 3.13 and gives the corresponding time from the model's output reports.

The analysis was conducted for the yard operations for the cars which were dispatched from the yards on the fifth day of the simulation. This particular simulation day was chosen since, by the fifth day, the simulated operations of the yards had reached a steady state. Thus, the operations on this day represented ongoing yard operations.

The data for each inbound train arriving at the yards during the simulation and each outbound train and block dispatched from the yards on the fifth simulation day were taken from the model and stored in computer files. CONSAD created an additional file which contained a breakdown of the cars in each outbound classification for the yards by: 1) the inbound train on which the cars arrived at the yard, 2) the number of cars of that classification on the particular inbound train, and 3) the arrival time of the inbound train at the yard. Together, these files formed the detailed information base by which the time elements were calculated for inbound train-outbound block pairs.

In order to perform the mathematical operations required for the analysis, CONSAD developed a computer program to be applied to this detailed information. This program served three major functions:

- The assignment of cars arriving at the yards on inbound trains to outbound trains and classifications;
- The calculation of the values of various time elements for cars moving through the yards; and
- The tabulation and summarization of the results of this analysis.

This was done so that yard performance could be examined not only in the aggregate, but for specific inbound-outbound blocks as well.

Exhibit 3.14: Event Time Source Index

Event	Model Equivalent	Output Report
Time of Arrival at Yard on Inbound Train	ARR Time	Inbound Train History
Time of Arrival At Receiving Track	REC Time - REC DELAY*	Inbound Train History
Time of Departure from Receiving Track	START HUMP	Inbound Train History
Time of Departure from Classification Track	START PULL	Outbound Train History
Time Ready to Depart	END INSP	Outbound Train History
Time of Departure on Outbound Train	ACTUAL DEPART	Oubound Train History

*REC DELAY was considered to be the exact equivalent of Hold-Out Time.

The results generated by the computer analysis of the yards' operations were tabulated in six different ways, as follows:

- Inbound Road;
- Outbound Road;
- Inbound Train;
- Outbound Train;
- Outbound Characteristics; and
- Time of Day Interval.*

Overall performance measures for all cars processed were also determined.

The detailed results of this analysis for all yards and years simulated are presented in Appendix B of this report. The tables in this appendix show both aggregated time in car hours and average unit times in car hours per car for total car detention time and for each of the five time elements making up total detention time. For each yard/year combination, a series of six such tables are provided which present the results of the analysis for each one of the six different ways in which the data were tabulated or grouped.

3.3.2 Corridor Operations

Corridor Simulation and Analysis

The analysis procedure used in the evaluation of study area rail corridor operations was based upon a simulation of the processes followed every day in the terminal to move trains. That is, train dispatchers and operators at interlocking control stations directed the movement of trains within and through the terminal area.

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*Based on time of arrival at the yard on an inbound train six four-hour intervals between 2230 on day 4 to 2229 on day 5.

Within the terminal area as shown in Exhibit 3.5, the majority of train movements are supervised by two train dispatchers located at SH Tower on the TRRA, and by an assistant general yardmaster at Gateway Yard on the A&S. One of the two dispatchers at SH controls movements between WR Tower and Gratiot Street Tower, and between SH Tower and CP Junction. The other dispatcher at SH controls trains between CP Junction and Valley Junction, and between May Street and Rock Island Junction, an area not being studied in detail. The A&S assistant general yardmaster at Gateway Yard functions much in the same manner as a train dispatcher, and controls corridor movement between Lenox and Tolson on the A&S. The other segments of the study area are either: 1) under the control of a dispatcher at some other location (e.g., Conrail at Indianapolis for the segments Lenox-WR-Bridge Junction and Exermont-Q Tower on Conrail, and Washington, Indiana for the segment Caseyville-Q Tower on B&O; or 2) under the supervision of a train director (e.g., TRRA Tower 2 for movements between Gratiot Street Tower and Grand Avenue, and the City of St. Louis MacArthur Bridge Commission at Gratiot Street Tower for movements on the MacArthur Bridge). There are several interlocking towers within the area, with movements within and proximate to the interlocking under the supervision of the interlocking control operator. These operators use the interlocking to move trains on one or more corridors in accordance with the appropriate dispatchers' instructions, and attempt to minimize delay and conflicts at the interlocking. Within the study area are several yards, where trains originate and terminate, and non-interlocked junctions. In order to analyze the operation of trains and evaluate the selected corridors at projected levels of traffic under each proposed restructuring alternative, CONSAD decided to simulate the interaction between the various operators and the three primary dispatchers. This simulation allowed the performance of each train to be documented, including the identification of conflicts at the various interlockings, junctions, and yards.

The following is a brief description of the process employed to simulate and analyze the corridor operations in the St. Louis Terminal Area.

The first step in this simulation process was to subdivide the terminal study area into logical sub-parts, with each sub-part containing a relatively small number of interlockings, junctions, and yards. Exhibit 3.15 is a schematic of the terminal area showing the subdivision of the study area.

As in the "real world", in the simulation process the "dispatcher" supervised the movement of trains on main tracks between interlockings/ junctions/yards. The next step in this process was to compile a list of trains to be analyzed in the study from the traffic data, and create an appropriate list of running times by class of train, by track, and by direction, for trains between the various interlockings, junctions, and yards.

Functional schematics for each interlocking, junction, and yard part, with possible through routes labeled by origin-destination characters, as shown in Exhibit 3.16, were developed, and forms for use by each individual involved in the simulation process were created. The train sheet, to be used by the "dispatcher" is attached as Exhibit 3.17.

The station log sheet, Exhibit 3.17, was designed to be used as an annotated time-route occupancy graph. Time was displayed across the top,

Exhibit 3.15: Schematic of St. Louis Gateway

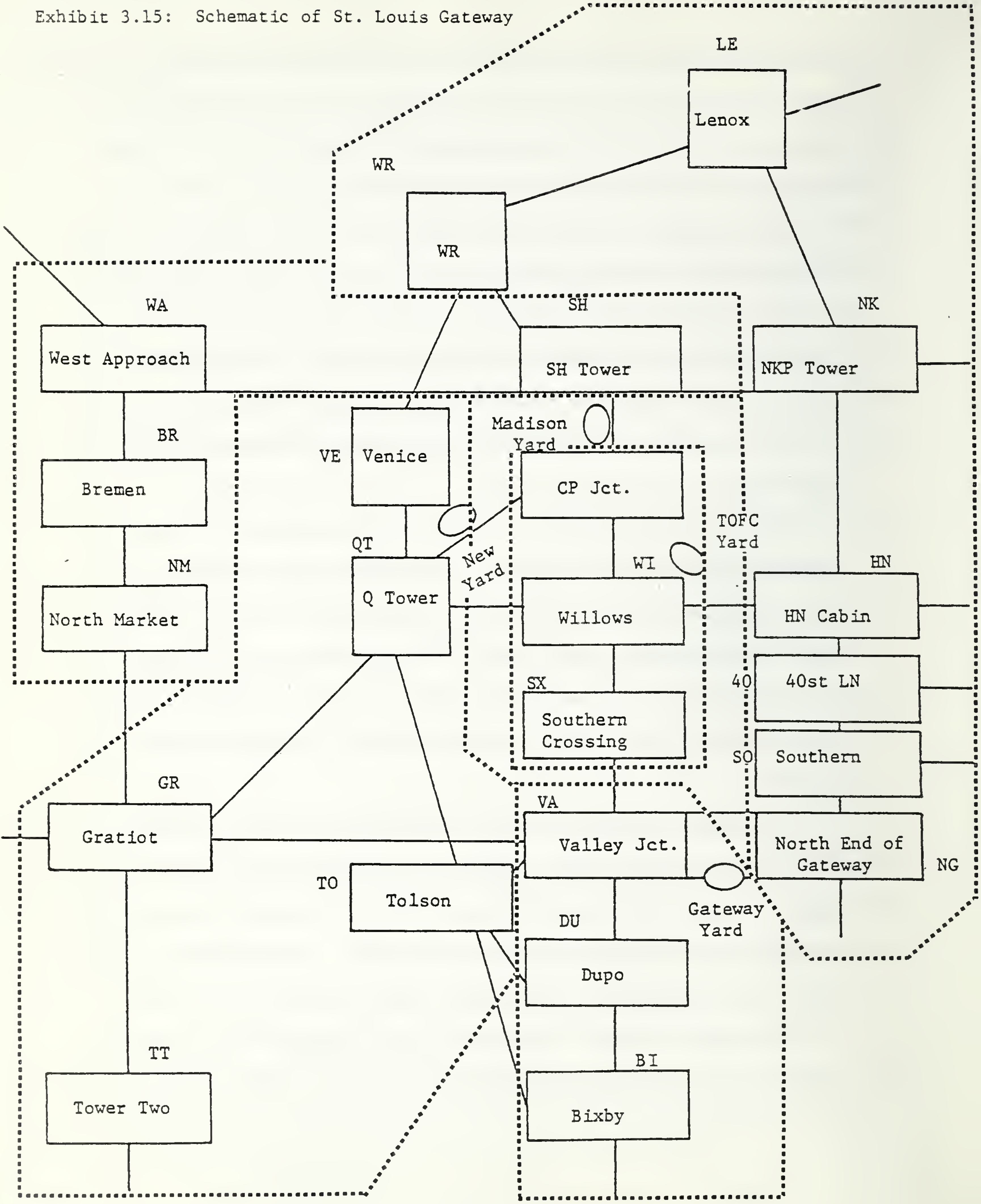


Exhibit 3.16: Functional Schematic of West Approach Interlocking

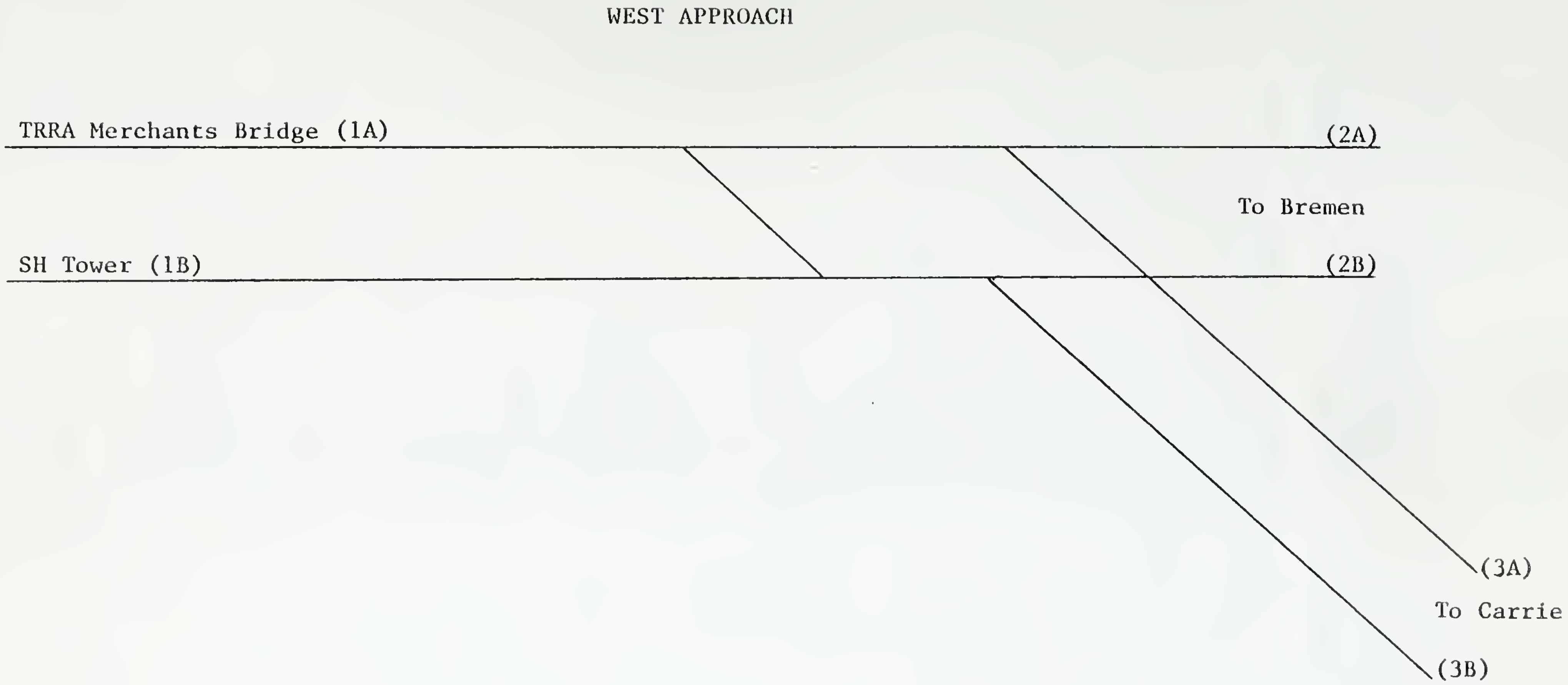


Exhibit 3.17: Train Dispatcher Sheet

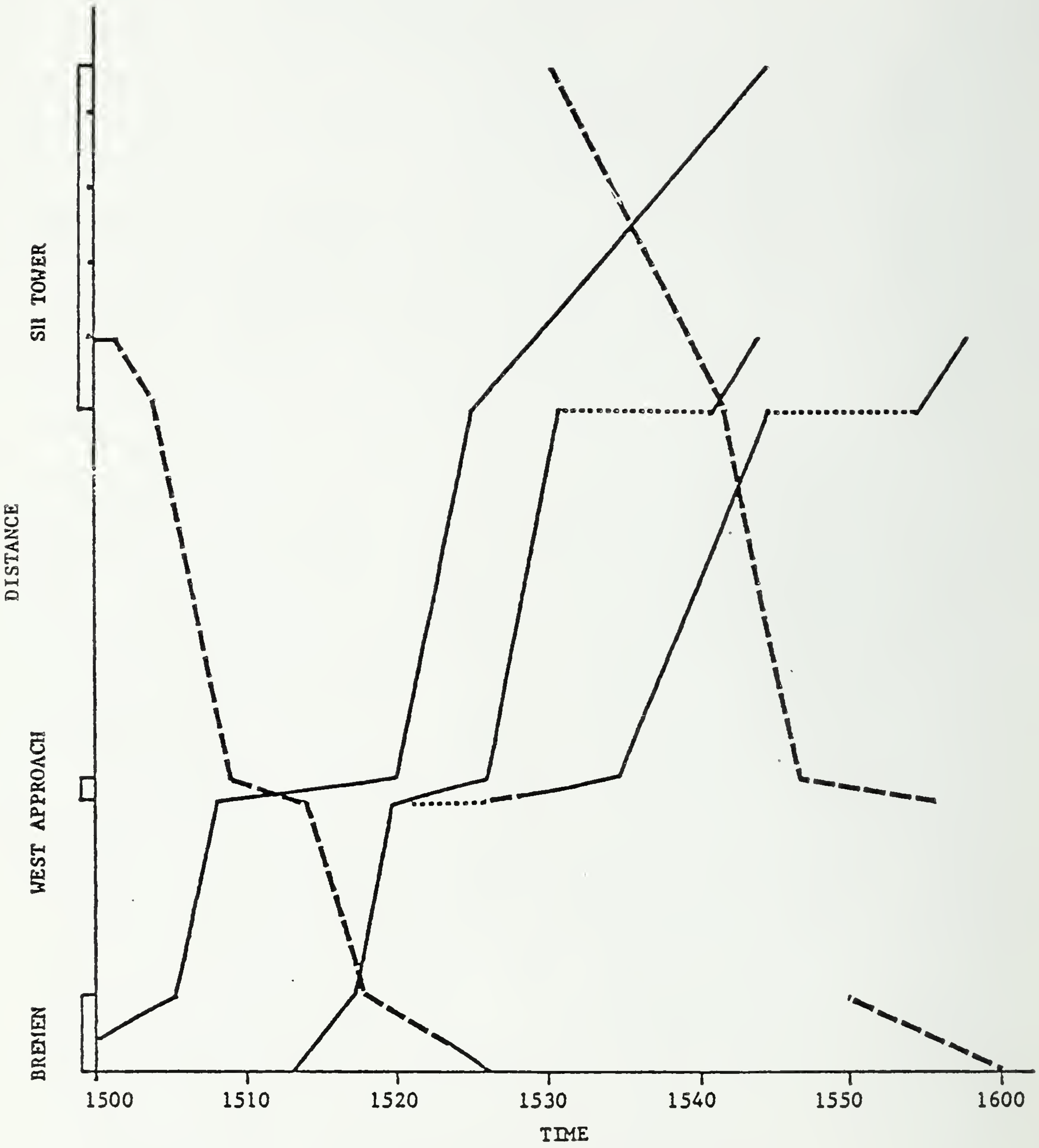
East Bound					Road	West Bound				
					Road Identification					
					Study Identification					
					Cars					
					Destination					
					Lenox					
					Mitchel Yard					
					"AA" Siding					
					NKP Tower					
					Horseshoe Siding					
					HN Cabin					
					40th St. LN					
					Southern					
					3rd Main					
					Gateway Yard					
					Valley					
					Tolson					
					Fox					
					Lenox					
					Trks (1, 2, NWMain)					
					WR Tower					
					Trks (EB, WB, 1, 2, Cwks)					
					SH Tower					
					CP Junction					
					Willows					
					Sou Xing					
					Valley					
					Trks (1, 2, 3, 4)					
					Dupo					
					Bixby					
					WR Tower					
					Venice					
					Q Tower					
					Mio Junction					
					Tolson					
					Bixby					
					SH Tower					
					West Approach					
					Bremen					
					Trks (1, EB, WB, 4)					
					N. Mkt					
					Gratiot					
					Tower 2					
					Grand					
					HN Cabin					
					Willows					
					Q Tower					
					Gratiot (Jct. No. App)					
					M&O Junction					
					Trks (NB, THORO, SB)					
					"C" Yard					
					Trks (NB, THORO, SB)					
					Valley					
					Tolson					
					Valley					
					Jct. No. App.					
					Jct. So. App.					
					Gratiot					
					CP Junction					

left to right, in one minute increments. The row headings down the left hand margin described events or facts by notation being made in the appropriate box for the time of the event. Appropriate notations include train ID in the case of Prior Stations, Dep-Arr (or Arr-Dep); minutes for this train to run between stations in the case of running time; and route description in origin-destination characters in the route rows. In this manner conflicts were determined by scanning labeled schematics, and delays were depicted from notation.

When a day of activity was replicated, a series of tables were completed. The purpose of these tables was to provide an orderly, systematic, logical analysis of the train operation, highlighting delays and excessive running times.

After the results of this process were presented to the RTAC, several changes in corridor operations were suggested. The most effective way of dealing with these changes was to create time-distance graphs, commonly called stringlines. Exhibit 3.18 shows an example of such a stringline. The vertical axis of the stringline is distance, with significant features of each corridor shown, such as stations, crossovers, railroad crossings, and junctions. The horizontal axis of each stringline is time. Each axis is scaled. Diagonal lines indicate trains, with the slope indicative of speed and delays shown by "flat" (horizontal) lines. A separate stringline was created for each corridor, and each train was drawn in. Changes were then made to the stringlines as changes were made in corridor operations. The conflicts caused by changes were readily apparent. After all changes had been made, the times were taken off the stringlines and matched with train data already in the operations analysis computer files.

Exhibit 3.18: Sample Stringline



Note: Stringlines are drawn to show occupancy of and activity on corridor for a twenty-four hour period. The above illustration is a one hour portion of a stringline of the Merchants Bridge Corridor.

This allowed the generation of a myriad of corridor statistics, which provided input to the costing processes required, as well as input to the environmental impact statement. Summaries of these statistics are shown in Appendix C.

Yard Hold-Out Analysis

An important consideration in the analysis of the corridor system was the impact that yard hold-outs would have on corridor operations. For the purposes of this study, a yard hold-out was defined as a train, inbound to a yard, that could not be received by the yard upon its arrival and was then held on a corridor until it was able to move into the receiving yard.

In order to accurately assess the impacts of yard hold-outs, it was necessary to know: the specific trains held out and their length, in cars; the route or corridor on which they were approaching the yard; the times at which they were eventually received; and the duration of the delay. All of this information, except train routings which could be determined from CONSAD's detailed traffic data, was providing in the Inbound Train History Reports from the Conrail Yard Model simulations. Unfortunately however, the Conrail Yard Model's hold-out times (Receiving Delay) encompassed only delays due to the unavailability of receiving tracks and conflicts of movement with other inbound trains being received at the same time; and did not comprehend or simulate other types of conflicts in and around the receiving yard, which potentially could result in trains being held out. These other types of conflicts that could exist were highly dependent on the physical lay-out or configuration of a particular yard, but included some or all of the following:

- Interference between inbound trains and hump lead activity;

- Interference between inbound trains and car cuts being pulled from the receiving yard to the hump lead(s);

- Interference between inbound trains and the doubling of cars of other inbound trains onto receiving trucks; and

- Interference between inbound trains and pull-out leads, where the movements of cars from the bowl to the departure yard and then out of the yard was taking place.

Because the Yard Model did not provide a complete picture of yard hold-out, it was necessary to perform additional analysis on the yard simulation results, so as to develop more complete estimates of hold-outs for inclusion in the corridor operations analyses. This analysis took the form of a manual adjustment of the Inbound Train History Report data to reflect the additional hold-out that might occur at a particular yard, due to the types of conflicts not originally comprehended in the yard simulations.

The basic procedures employed in the manual adjustment process were as follows:

1) Yard configuration was examined in detail and a specific set of inbound movement conflicts were defined for the yard (these were defined for each group of tracks in the yard relative to each possible inbound route);

2) The route of each inbound train approaching the yard was determined from CONSAD's traffic data;

3) Standard times required to complete certain movements were calculated, based on the model input parameters and the distances involved;

4) The train specific movement data in the Inbound Train History Report were used as the base from which the analysis was conducted, with the track assignments, etc. held constant;

5) The movement of each inbound train, in time of arrival sequence from first train of the day to last train of the day, was traced and, on the basis of the information developed in Steps 1-4, conflicts with other yard activity were identified;

6) If conflicts were found to exist, the train was held out of the yard until the conflicting movement(s) were completed, re the Inbound History, and the train could be received;

7) Delay resulting from the hold-out was calculated and the event times for that train in the Inbound History were adjusted accordingly (see Exhibit 3.11).

8) Each subsequent train was examined and hold-outs determined based on the adjusted event times of preceeding train movements; and

9) Finally, after the movement of all trains were analyzed and train by train hold-outs determined, a summary of total estimated minutes of hold-out time and car-minutes of delay were determined for the yard.

The above analysis was conducted for each common yard under each alternative and in each year analyzed. The results of these analyses have been summarized and are presented in Appendix D.

The results of these analyses were then factored into the corridor operations analyses through the use of the previously mentioned "stringlining" technique. Since the specific corridor or route for each inbound train held-out was known, the impact of that specific hold-out on the corridor could be assessed (i.e., the line representing the train was adjusted to reflect the delay caused by the hold-out, and the impact of the delay on other trains operating in the corridor was determined by the adjustments necessary to avoid conflicts). The impacts of changes in operations due to yard hold-outs on these corridors could be cascaded throughout the entire corridor network to determine the effects of hold-outs on the performance of the entire system.

3.3.3 TOFC Operations

The restructuring of physical facilities and operational patterns proposed in the Phase I Study included a plan for the establishment and operation of a common intermodal terminal. The impetus for the development of this facility was two-fold. First, some roads would be scaling down or completely abandoning their "home yard" facilities and need an alternative location for intermodal operation. Second, current high service levels demand over the road interchange of intermodal traffic, an operation which is acknowledged to be both inefficient and extremely expensive. Eight of the 14 line-haul railroads with operations in the study area have indicated a desire to participate in this type of facility (BO, CNW, CR, ICG, ITC, LN, MKT, and MP).* These eight roads accounted for approximately 67% of all study area intermodal freight handlings in 1979 and are projected to account for 72% of the intermodal traffic in the year 2000.

The proposed terminal facility is to function as: 1) loading/unloading point for all local industry traffic; 2) a classification yard to effect interchange among participating roads and between the participating roads and non-participating roads; 3) an outbound train yard to build outbound TOFC/COFC blocks for solid intermodal trains and for trains departing other classification yards with other traffic; and 4) as a storage facility for trailers and flat cars. Given this, and information supplied by CONSAD on the volume and type of intermodal traffic that potentially would be handled by the facility, SEK devised an initial design for the common TOFC/COFC terminal.

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*CRIP traffic included for analytic consistency with study day - CRIP operations discontinued March 1980, volume less than 3% of total.

A manual simulation of the consolidated intermodal terminal was designed by CONSAD to evaluate the interaction between the physical structure of the proposed terminal and the projected container flows anticipated for the eight rail carriers currently planning to participate in the facility. The overall procedure of the simulation developed by CONSAD is depicted in Exhibit 3.19. In general, CONSAD simulated the movement of inbound and outbound traffic in the terminal area according to the assumed operating policies. The simulation was framed to measure the performance of the system for the evaluation of the proposed plant. The resulting information from the simulation process included the processing time of trailers and trains, the utilization levels of the facilities and the required manpower to conduct the terminal operations.

Input Data

The physical structure of the intermodal terminal to be evaluated was furnished by SEK. The relevant features of those inputs for the simulation are summarized below.

The physical dimensions of the major facilities have been described in Exhibit 3.20. The traffic data base for 1979 was developed by adding the observations of inbound and outbound trains and trailers handled by

Exhibit 3.19: Schematic Diagram of Simulation

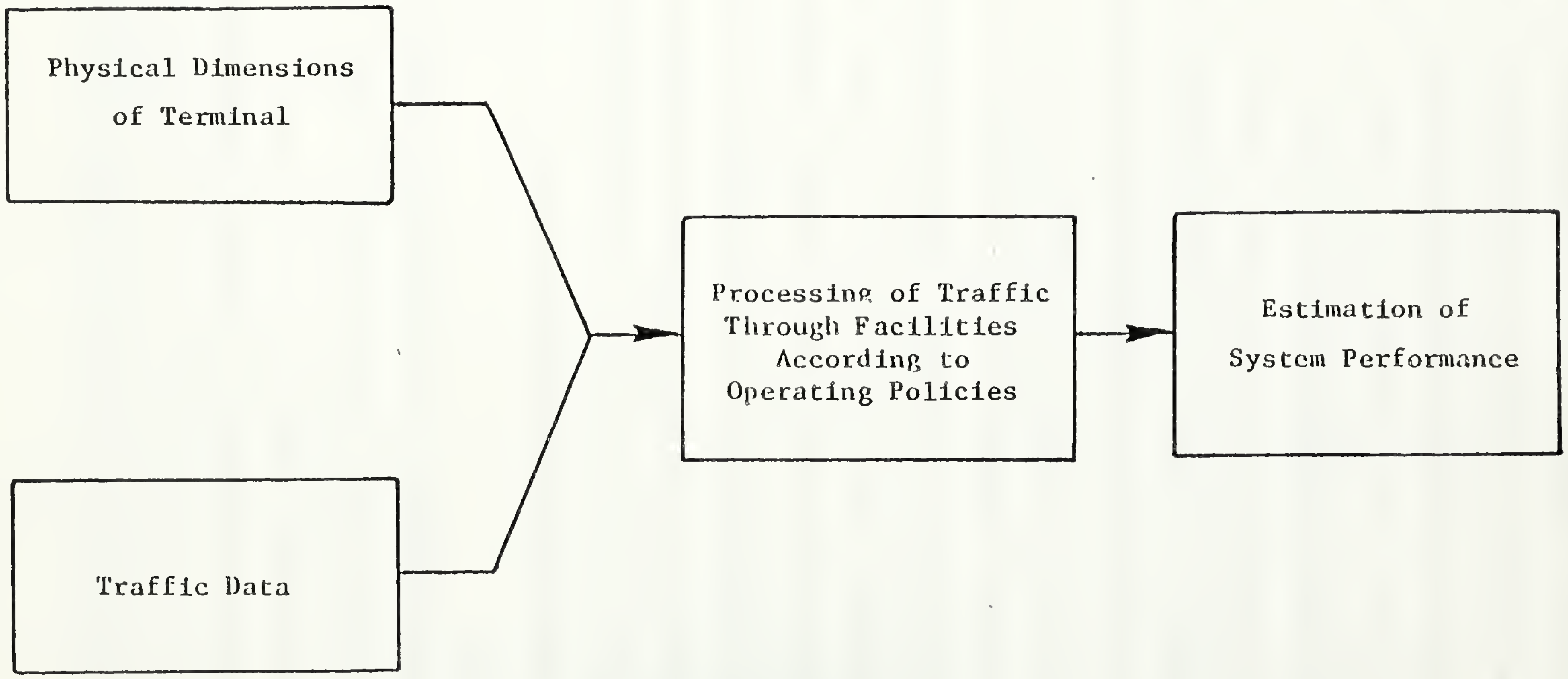

Physical Dimensions of Terminal
Traffic Data
Processing of Traffic Through Facilities According to Operating Policies
Estimation of System Performance

Exhibit 3.20: Physical Dimensions of Common TOFC Terminal (Final Design Configuration)

Facility	Number of Tracks	Average Track Length (flatcars)
Pad Tracks (Loading/Unloading)	Short - 7 Long - 6	26 54
Storage Tracks	2	60
Receiving/Departure Tracks	2	61
Flatcar Repair and Storage of Locomotive and Caboose	8	10

the eight potential participants on March 30 of that year. The demand patterns in 1985 and 2000 were projected by multiplying the 1979 traffic by growth factors supplied by the carriers.

The necessary information about each inbound and outbound train for the simulation is as follows:

- Schedule of train;
- Number of flatcars;
- Number of trailers; and
- Destination of each trailer.

A summary of the traffic data input to the simulation is presented in Exhibit 3.21.

Operational Simulation Procedures

Having discussed the data input to the analysis, it is now appropriate to describe the procedures used to simulate inbound and outbound terminal operations. The inbound terminal operation refers to the breaking-up of an inbound train into locomotive, caboose, and flatcars and the movement of trailers from flatcars to storage lots. The outbound terminal operation involves the making-up of an outbound train and the loading of trailers. Both inbound and outbound terminal operations, which are interrelated, are composed of the sequence of sub-operations defined by the decisions made by the three operators: yardmaster, rail supervisor and gate supervisor.

Exhibit 3.22 depicts the flow chart for the terminal operation of an inbound train, given its arrival time, number of flatcars, and number of trailers. The hexagon signifies a decision-making component in the

Exhibit 3.21: Volume Distribution of Rail Activities

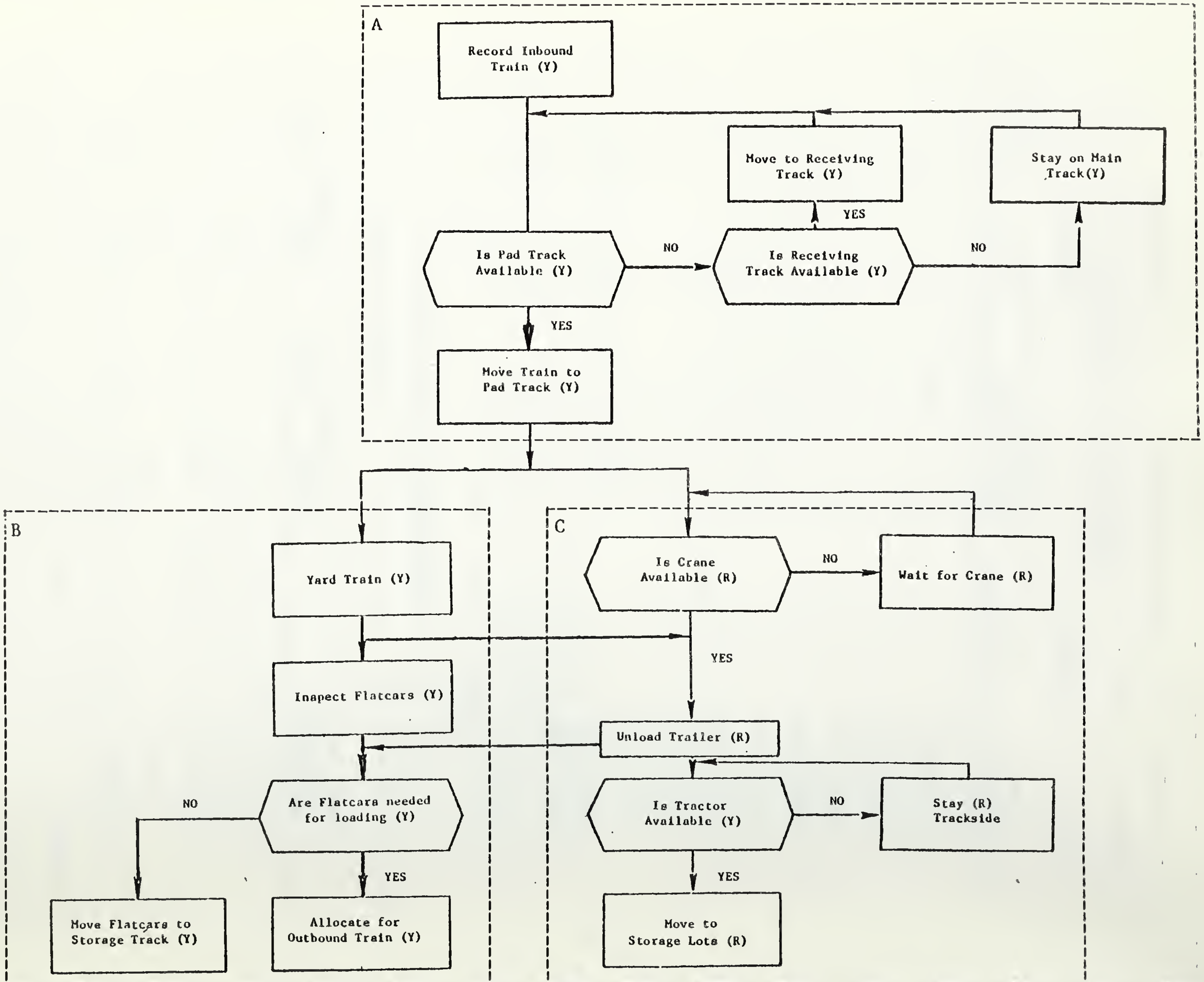
Distribution by Time Period

	INBOUND			OUTBOUND		
		Number of Trailers			Number Of Trailers	
Time Period	Number of Trains	1985	2000	Number of Trains	1985	2000
0001-0200	1	91	125	1	43	102
0201-0400	3	68	122	2	57	66
0401-0600	2	59	77	1	30	72
0601-0800	2	72	174	2	85	163
0801-1000	1	36	52	0	0	0
1001-1200	3	62	100	3	93	199
1201-1400	2	74	114	0	0	0
1401-1600	0	0	0	2	35	69
1601-1800	3	192	341	1	39	93
1801-2000	1	20	32	3	114	202
2001-2200	0	0	0	4	123	210
2201-2400	2	65	152	3	136	237
Totals	20	739	1289	22	755	1413

Distribution of Train Length

	Number of Trains			
	Inbound		Outbound	
Train Length (Flatcars)	1985	2000	1985	2000
15 or less	2	0	2	0
16 - 30	10	5	9	3
31 - 61	4	8	10	8
Over 61	4	7	1	11
Total	20	20	22	22

Exhibit 3.22: Flow Chart for Inbound Terminal Operations



terminal operation and the rectangle refers to a sub-operation to be undertaken in the simulation process. The letter Y, R, or G in parentheses indicates whether the yardmaster, rail supervisor, or gate supervisor, respectively, is responsible for carrying out the activity specified in the hexagon or rectangle.

The activities belonging to Block A are associated with the movement of an inbound train within the terminal area before the breaking-up of the train and the unloading operations of trailers can be started at the pad (loading/unloading) track. The activities in Blocks B and C correspond to the breaking-up process of the train and the unloading procedure of the trailers, respectively. The actions specified in the rectangle and their time factors are described below.

- Yard on Pad Track - When a train approached the terminal, the yardmaster searched the available pad tracks. The availability of the tracks depended on the presence of empty pad tracks and the train length. If an empty track was longer than the train length, the yardmaster could spot the train on that track. On the other hand, if the train length was longer than the track the remaining portion of the train could be yarded on other empty spaces of other pad tracks.

- Move to Receiving Track - If a pad track was not available, the incoming train was moved to a receiving track or remained on the main track. This operation required the additional handling time associated with the following activities:

  Spot train on receiving track;

  6 minutes if train length $\leq$ track length

  21 minutes if train length $>$ track length

  Move train to pad track: 15 minutes.

- Yard Train - After the train was spotted on the pad track, the rail supervisor undertook the sequence of operations shown in Exhibit 3.23:

  The time factors in carrying out those actions were:

  Cut train:

  6 minutes if train length ≤ ½ track length

  10 minutes if train length > ½ track length

  but < track length

  25 minutes if train length > track length

  Blue flag on:* 10 minutes

- Inspect Flatcars and Unload Trailers - These two operations were undertaken as shown in Exhibit 3.22. The time factors in carrying out those actions were:

  Inspect flatcars: 5 minutes + 1 minute/car

  Remove bad order car: 25 minutes

  Unload trailers: 2 minutes/trailer

  Blue flag off: 2 minutes/trailer

- Move flatcars to storage track - If the unloaded flatcars were not designated for an outbound train, they were moved to storage tracks. The operation had the following activities:

  Prepare to clear the track:

  15 minutes if train length ≤ ½ track length

  27 minutes if train length > ½ track lenght

  Move to storage track: 10 minutes.

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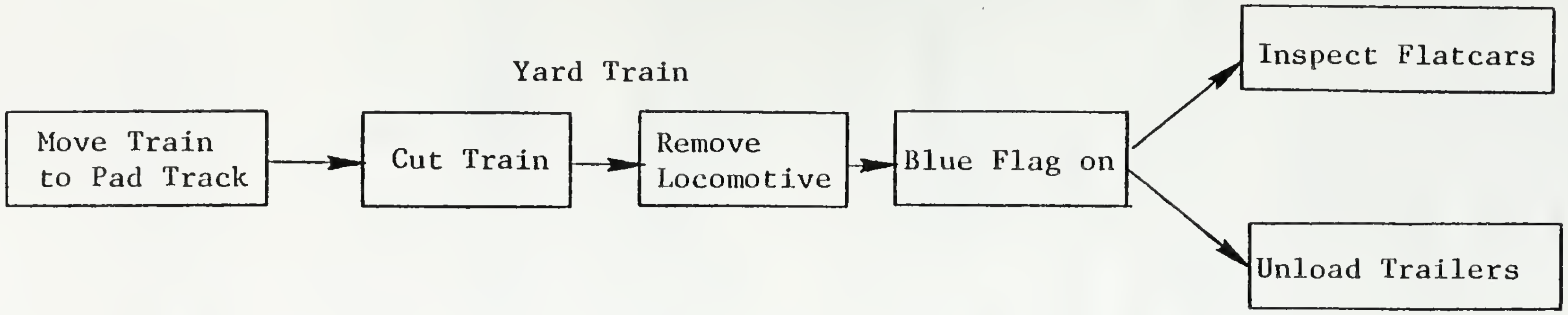
*Process of placing a signal flag on a track to provide protection for workmen in accordance with Part 218, Subpart B, of the Code of Federal Regulations.

Exhibit 3.23: Flow Chart for Yarding Train



The outbound terminal operation was initiated by taking inventory of the trailers accumulated for the outbound train and the flatcars available about five hours before the departure schedule. After determining the trailers to be loaded, about four hours before scheduled departure, the pad track, where the loading operation would occur, was chosen. The details of the operating procedures are depicted in Exhibit 3.24.

Activities within Block A correspond to the decision-making processes before the actual operations of train make-up and trailer loading can be started. Activities in Block B represent the sequence of sub-operations involved with the movement of flatcars. Block C specifies a sequence of activities for the loading operation of trailers. The details of the tasks and the time factors associated with each action are described below:

- Choose Pad Track - The necessary length of the pad track depended on the train length. If the train length was longer than an available track length, an additional track was allocated.

- Spot Flatcars - The time required to spot flatcars depended on the length of the train and the presence of flatcars on the track, as shown below:

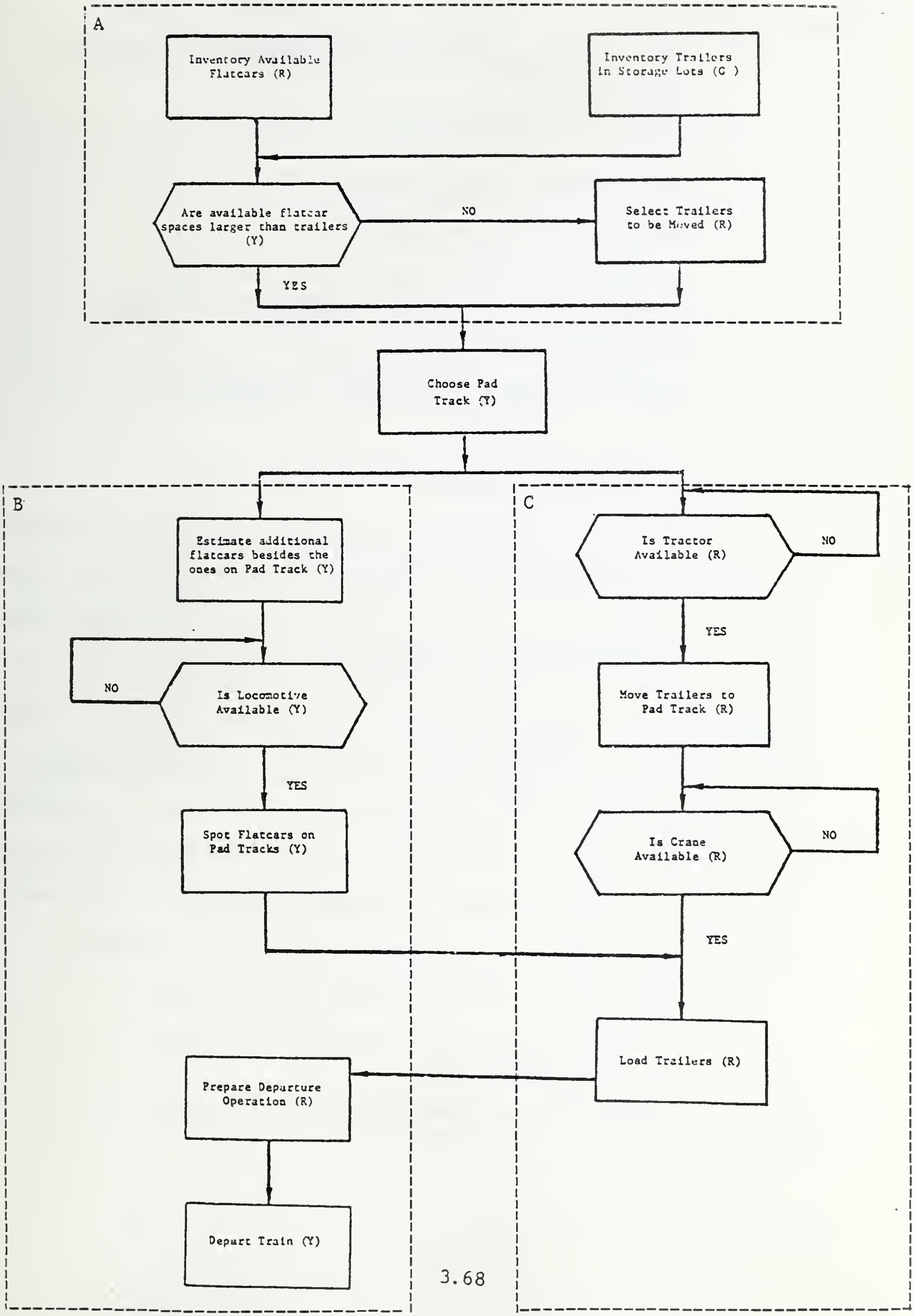
  Move flatcars from storage track: 60 minutes if necessary

  Set flatcars:

  20 minutes if train length $\leq \frac{1}{2}$ track length

  30 minutes if train length $> \frac{1}{2}$ track length

Exhibit 3.24: Flow Chart for Outbound Terminal Operation


A
Inventory Available Flatcars (R)
Inventory Trailers in Storage Lots (G)
Are available flatcar spaces larger than trailers (Y)
NO
Select Trailers to be Moved (R)
YES
Choose Pad Track (Y)
B
Estimate additional flatcars besides the ones on Pad Track (Y)
NO
Is Locomotive Available (Y)
YES
Spot Flatcars on Pad Tracks (Y)
Prepare Departure Operation (R)
Depart Train (Y)
C
Is Tractor Available (R)
NO
YES
Move Trailers to Pad Track (R)
Is Crane Available (R)
NO
YES
Load Trailers (R)

- Load trailers - This activity necessitated a sequence of sub-operations. The time factors for those sub-operations were:

  Blue flag on: 10 minutes

  Load trailers: 2 minutes/trailer

  Blue flag off: 10 minutes.

- Prepare Departure Operation - After the loading operation was completed, the locomotive and caboose were attached and the air test was made. The time factors for those activities were:

  Connect locomotive and caboose: 15 minutes

  Air test: 25 minutes

Simulation Output and Analysis

The simulation started with a hypothetical arrangement of flatcars, locomotives, and cabooses over the terminal area at 2300 hours. However, the actual arrangement at the time was influenced by the terminal operation of the previous day. It was therefore necessary to iterate the simulation up to the point at which the arrangement exhibits the identical pattern with the one at that time period of the previous day.

During the simulation, the three persons who worked as yardmaster, rail supervisor, and gate supervisor recorded their actions on the prepared sheets in order to amass the necessary information. The simulation data recording forms were designed to record the following:

- Starting and terminating times of every action;
- Starting and terminating times of utilizations of various tracks; and
- Number of crews, flatcars, cranes and tractors required for each time period.

The records made during the simulation were tabulated and summarized to produce the following types of information:

- The utilization levels of the various tracks constituting the proposed system;
- The required fleet sizes of mobile resources and their utilization levels; and
- Estimates of personnel requirements related to facility operations.

Based on these results, CONSAD was able to:

- Determine whether the proposed system could effectively accommodate the projected traffic of the eight carriers involved:
- Determine whether every component of tracks in the integrated system had a balanced level of utilization;
- Propose alternative arrangements of fixed facilities (i.e., track) which would improve the terminal operation; and
- Evaluate the effectiveness of the employment of the facilities' resources (fixed and mobile) in relation to its traffic base.

The results of CONSAD's analysis of common TOFC operations are summarized and discussed in Section 4.3 Common TOFC Service.

3.4 Reliability of Operations and Transit Time

3.4.1 Reliability

In evaluating the performance of the proposed alternatives for the operation of the rail facilities in the study area, three basic measures of performance were selected. These were cost, transit time, and reliability. The measurement of each of these indicators, and the evaluation of these measures, has been treated as though each was an independent quantity, in spite of the fact that each is, to some degree, related to the others. The reason for this is twofold. First, the relationships among the various indicators are indirect, and second, the importance of each indicator varies with the perception of the viewer.

CONSAD's operations analysis of the St. Louis Railroad Terminal restructuring involves the analysis of four major operating plans: No Build, Two-Yard Directional, Three-Yard Directional, and Three-Yard Bidirectional. These alternative plans, due to the unique set of operational strategies embodied in each, should have somewhat different levels of operational reliability associated with them. Therefore, in order to be able to fully evaluate the performance of alternative restructuring plans relative to one another, it was necessary to develop some measure(s) of the reliability of railroad operations under each restructuring plan.

Reliability in railroad operations has been previously addressed in a series of studies conducted at the Massachusetts Institute of Technology in the early 1970's. In that work, various ways of defining reliability were considered, all of which related to "Compactness" (lack of spread) of trip time.

The MIT research also dealt with the events or conditions which lead to unreliability.

While the St. Louis restructuring study was different in several respects from the railroad operations analyzed by MIT, some of the principles for measuring reliability were adaptable to the St. Louis Study. In particular, CONSAD determined that "number of times handled", "missed connections" and the "distribution of transit times" for cars moving through the study area were the essential aspects of service reliability that could and should be addressed in analyzing the four St. Louis alternative operating plans.

The key aspect was missed connections, the number and percent of cars which moved through the study area and exited on other than their "scheduled" connections. It was the focus of much of CONSAD's efforts on this subject.

Missed connections include both early and late departures. Early departure is probably not as undesirable as late departure inasmuch as this may provide slack which may guarantee connections at subsequent yards. However, given fixed levels of resources, early departure may cause other traffic to move late. Thus, both early and late departures from the study area may be undesirable.

CONSAD has performed simulations of train movements and, in turn, traffic flows throughout the St. Louis Gateway. This has involved separate but interrelated simulation of three common yards, the proposed common TOFC facility, and the 35 segments which comprise the study area corridor system. One set of specifications of the system was the set of arrival and departure times for inbound and outbound road trains, transfers, and local industrial service. This de facto train schedule has been carefully interrelated between yard and corridor simulations so that train departure onto the corridors and arrivals at yards, as per the corridor simulation, match the times at which trains depart and arrive at the common yards.

The steps through which a car switched at St. Louis passes include some or all of the following:

- Arrival at a home yard;
- Switching at the inbound home yard;
- Movement by a transfer train to a common classification yard;
- Switching at the common yard;
- Movement on a second transfer train to a second common classification yard;
- Switching at the second common yard;
- Movement on a transfer to an outbound home yard;
- Switching at the outbound home yard; and
- Departure on an outbound road train.

The above is the extreme. Exhibit 3.25 shows the number and percentage of cars handled with varying numbers of transfer movements, under each of the major alternatives. Each transfer movement represents an additional handling of a car, with each additional handling carrying with it the potential for missed connections. Thus, this list defines the possible points in the move through the study area at which connections can be missed and where reliability may drop as a result.

Exhibit 3.25: Car Handling Under Restructuring Alternatives

	1979 No Build
Cars in thru trains	2070 (23%)
Cars to be handled	
with no transfers	1585 (18%)
with 1 transfer	3269 (36%)
with 2 transfers	1683 (19%)
with 3 transfers	393 (4%)
Subtotal - cars handled	6930 (77%)
Total Cars	9000 (100%)

	1985 No Build	 Two-Yard Directional	 Three-Yard Directional	 Three-Yard Bidirectional
Cars in thru trains	2690 (26%)	2690 (26%)	2690 (26%)	2690 (26%)
Cars to be handled				
with no transfers	1811 (17%)	3383 (32%)	4009 (37%)	4730 (45%)
with 1 transfer	3736 (35%)	4057 (38%)	3014 (28%)	3174 (29%)
with 2 transfers	1924 (18%)	449 (4%)	817 (8%)	0 (0%)
with 3 transfers	449 (4%)	31 (0%)	80 (1%)	16 (0%)
Subtotal - cars handled	7920 (74%)	7920 (74%)	7920 (74%)	7920 (74%)
Total Cars	10610 (100%)	10610 (100%)	10610 (100%)	10610 (100%)

	2000 No Build	 Two-Yard Directional	 Three-Yard Directional	 Three-Yard Bidirectional
Cars in thru trains	5940 (35%)	5940 (35%)	5940 (35%)	5940 (35%)
Cars to be handled				
with no transfers	2520 (15%)	4707 (28%)	5577 (33%)	6581 (39%)
with 1 transfer	5199 (31%)	5644 (33%)	4194 (25%)	4417 (26%)
with 2 transfers	2677 (16%)	625 (4%)	1137 (7%)	0 (0%)
with 3 transfers	624 (4%)	44 (0%)	112 (1%)	22 (0%)
Subtotal - cars handled	11020 (65%)	11020 (65%)	11020 (65%)	11020 (65%)
Total Cars	16960 (100%)	16960 (100%)	16960 (100%)	16960 (100%)

Note: Car in thru train = 0 car handling;
car handled with no transfers = 1 car handling;
car handled with 1 transfer = 2 car handling
car handled with 2 transfers = 3 car handlings, and
car handled with 3 transfers = 4 car handlings.

Whenever a rail car is switched (or handled) there are several opportunities for things to go wrong. The car can be bad ordered, no-billed, or misswitched, all of which result in delay. Thus, one indirect measure of reliability by which the operating plans could be compared is the number of times cars were switched in the study area. The total number of car handlings and the average handlings per car, under each alternative, were determined from the information provided in Exhibit 3.25 and are presented in Section 4.0, Results.

Delays may also occur in the normal process of classification. Not all cars are detained in a classification yard the same amount of time. Rather, there is a distribution of detention times. Thus, some cars which arrived at the yard later than others of the same outbound classification (or which required a longer time to process in the receiving yard) are more likely to arrive in the bowl after the pull time for that outbound classification and would be left behind to connect with the next later outbound train carrying that classification.

Another measure of reliability was missed connections and their effect on transit time of cars through the study area. In order to develop this measure of reliability, it was necessary to trace the movement of traffic through the study area in its entirety.

The system of interest consists of 1493 OD (Origin-Destination) Pairs in the base year (1979). An OD Pair consists of one or more cars to be switched in the St. Louis Gateway which are scheduled to move on the same inbound train and outbound train.* In the year 2000, that number is projected to increase to 1,787 OD Pairs. The tracing of all of these movements through the study area would have required an expenditure of resources greater than was either available or warranted for the reliability analysis. Therefore, CONSAD traced such movements on a sample basis to identify trains on which portions of the traffic move at each stage of their processing.

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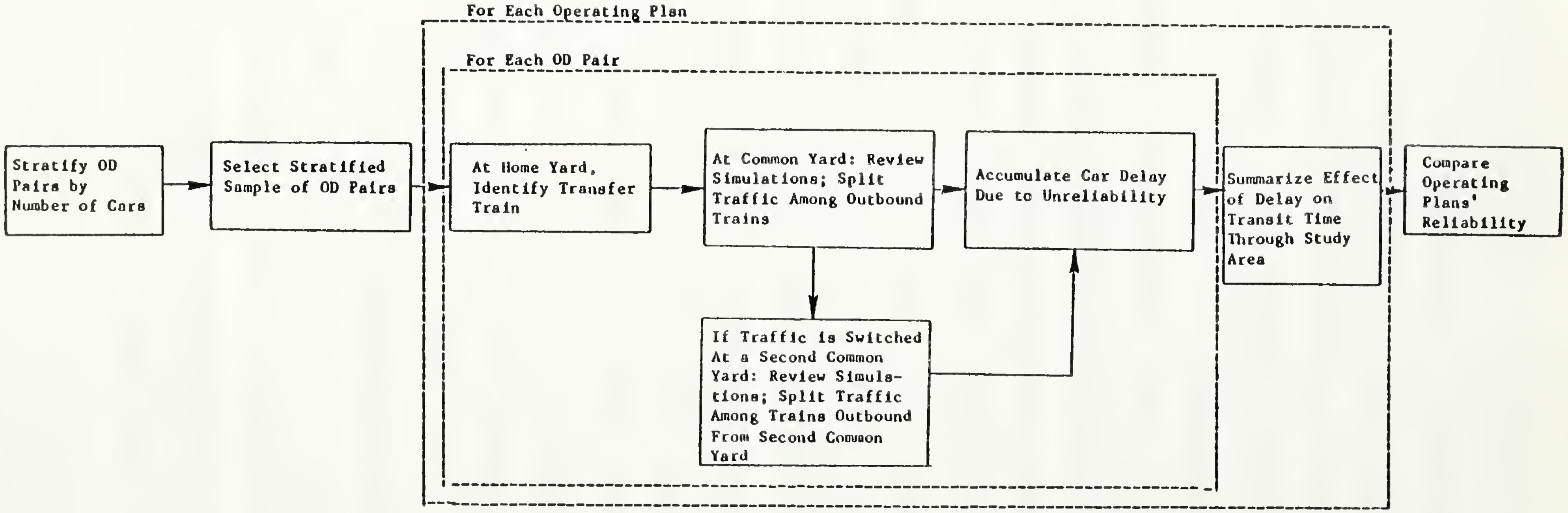
*Also included is traffic orginating and terminating in the study area.

A flow diagram of the steps in this process is shown in Exhibit 3.26. CONSAD decided to draw a sample of the OD Pairs which would exist in all three horizon years, and analyze their movements for all four alternative operating scenarios. Because cars in run thru trains were technically not "handled" in the study area, the OD Pairs for run thru train traffic were excluded from the sample. The remaining OD Pairs were ranked by size, measured in number of cars, and then stratified so that one half of the total number of cars was resident in each of two strata. A ten percent random sample of the OD Pairs in each stratum was then taken, yielding a total of 69 specific OD Pairs for analysis. Since the size of OD Pairs varied widely, this stratified random sampling plan ensured that the sample of OD Pairs eventually analyzed was reasonably representative of car movements in the study area, with both large and small moves given the appropriate consideration.

The tracing of these OD Pairs through the system was accomplished by referring to the results of the yard and corridor simulations. CONSAD identified all of the moves and assignments of all or part of the OD Pairs to specific intermediate and outbound trains. This

Exhibit 3.26: Flow Diagram of Procedure for Estimating Reliability in Terms of Rail Connections Made


Stratify OD Pairs by Number of Cars
Select Stratified Sample of OD Pairs
For Each Operating Plan
For Each OD Pair
At Home Yard, Identify Transfer Train
At Common Yard: Review Simulations; Split Traffic Among Outbound Trains
If Traffic is Switched At a Second Common Yard: Review Simulations; Split Traffic Among Trains Outbound From Second Common Yard
Accumulate Car Delay Due to Unreliability
Summarize Effect of Delay on Transit Time Through Study Area
Compare Operating Plans' Reliability

required knowledge of the connections made in the yards and the train schedules, all of which are contained in the data system. Having all of this information on hand and with minor processing of the yard simulation results, CONSAD developed the required car movement information.

The MIT work cited above showed that the most frequent cause of unreliable service was the failure of the car to operate on the outbound train, either because of a block being left off an outbound train, or an outbound train not being run, and the second most frequent reason was late arrivals of inbound trains.

Generally, inbound trains to the study area arrived within a range of seven hours ahead to eight hours after their de facto schedule. Outbound trains from the study area generally failed to operate one day per week or 14.3 percent of the time. For the purpose of this evaluation of reliability, it was assumed that the behavior of inbound trains (and the behavior of outbound trains, since it is a function of the behavior of inbound trains) would not differ between the various alternatives. The requirement each road haul carrier has to balance engines, cabooses, and crews is seen as the overriding criterion.

Thus, the reliability that is associated with each alternative is strictly the reliability of the facilities and their operation.

In accumulating and analyzing the traffic data for the Phase II study, it was determined that 2½ percent of the cars passing through the common yards were bad ordered so as to need spotting on a repair track, and that one percent of the cars were placed on the hold tracks due to improper, or lost, waybill information. From discussions with terminal area operating personnel, it has been determined that approximately one percent of the cars switched are switched into the wrong track, due to human error. This led to the conclusion that there was a 4.5 percent chance of some error in each switching or car handling in the terminal area. A switching error of the type mentioned here was almost certain to cause a car to miss its scheduled connection and thus it was assumed that there was an equivalent 4.5 percent probability of a missed connection associated with each switching or handling.

Given the above information, the probability that any car would make its scheduled connection in any facility was 81.8 percent (95.5 percent probability of no switching error times the 85.7 percent probability of the outbound train operating, since these are independent events). Thus, every time a car was handled it had an 81.8 percent probability of making its scheduled connection or, conversely, an 18.2 percent probability of missing its scheduled connection. Knowing the number of handlings involved with the movement of each of the sample OD Pairs through the system, it was possible to determine the percentage of cars in each OD Pair that would move through the system without missing a connection. This was done using the formula:

$$P_m = .818^n$$

where: P_m was the percent of cars making all scheduled connections;

n was the number of handlings for the OD Pair; and

$.818$ was the probability of making a connection for any handling.

The P_m factor determined for an OD Pair was then multiplied times the number of cars in that OD Pair to yield the number of cars making all connections and operating completely on schedule, with the number of cars missing at least one connection equal to the total number of cars less the number making all connections. Additionally, since the two components of P_m were known, probability of no switching errors and probability of the outbound trains running, it was possible to estimate the percentages and numbers of cars in each OD Pair not moving according to schedule due to switching error or mishandling and the number not moving due to the cancellation of their outbound train.

Weighted average statistics for the sample OD Pairs, under each alternative, were calculated and applied to the total traffic volumes which they represented to yield estimates of the number of cars not meeting their schedules, given the assumptions implicit in this analysis. These estimates have been summarized and are presented in the Results Section of this report.

3.4.2 Transit Time

The sample of OD Pairs used in the development measures was also used in the determination of transit time. Transit time is defined, for the purpose of this analysis, as the elapsed time between the entry of a car into the study area (or movement from a local industry) and the exit of that same car from the study area (or delivery to a local industry). The complete movement of each OD Pair was examined to determine the transit time. The results of these calculations are shown in Section 4.0, Results.

As part of the analysis of transit time, CONSAD measured the "compactness" of the distribution of transit times through the study area for cars in the sample OD Pairs. This served as the third and final measure of reliability. The distribution of transit times was measured as the standard deviation about the mean for transit time of cars under each alternative. The results of this analysis are also presented in Section 4.

3.5 Operations Cost Analysis

One of the critical determinations required for the evaluation of alternative restructuring plans for the St. Louis Railroad Gateway was the cost of operations that would be incurred by the railroads involved, under each alternative, and the relationship of those operating costs to the capital costs of implementing each plan. In this section of the report, the methodologies employed in the determination of operating costs for each of the operational components of the study area (i.e., yards, corridors, intermodal facilities, transfers, and home road operations) are described. The final portions of this section deal with the development of system costs for each restructuring alternative and the allocation and/or attribution of these costs to the various railroads associated with the restructuring effort.

Prior to the development of any specific methodologies for estimating costs, CONSAD examined several alternative approaches and potential sources of cost data. The following six general alternatives were identified:

- Develop railroad costs specific to St. Louis;
- Develop costs by individual railroad operating division;
- Develop system costs by specific Class I railroad;
- Develop system costs by specific Class I and Class II railroads;
- Develop actual Class II carrier costs, within St. Louis Terminal; and
- Develop zero-based costing.

In developing methodologies for the estimation of operating costs for each of the operational components, the various alternative approaches and data sources were reviewed and evaluated as to their applicability for use in the study based on the following primary criteria:

- Reliability of cost sources and operating statistics;
- Uniformity among cost accounts and operating statistics;
- Consistency in reporting;
- Availability of costs and operating statistics;
- Compatibility in relationship to analyzing historical cost data; and
- Time and effort involved in gathering cost data.

The general approach ultimately followed in the costing of operations for any one of the individual operational components was the one which best met the above criteria with regard to that component and the nature of its operations.

The different methodologies employed for the estimation of operating costs are described. However, it should be noted that, while the approaches taken in cost estimation for the various operating components may differ somewhat, the operating costs determined as a result of these methodologies are similar in two very important respects. These are:

1) Throughout the analyses, costs were determined for each of the same six major railroad activity/cost accounts (Maintenance of Way, Maintenance of Equipment, Transportation, General and Administrative, Equipment Capital, and Car Costs); and

2) All costs were estimated in constant 1979 dollars.

These two similarities made it possible to aggregate individual operating components (yards, corridors, etc.) costs to yield uniform system costs, and allowed meaningful comparisons between the operating costs estimated for various restructuring alternatives and years to be made.

3.5.1 Yard Operations Costing

The general approach followed in the costing of operations of the common railroad yards involved in the study was to develop actual Class II carrier costs for the two major terminal and switching companies operating within the St. Louis Gateway, namely the Terminal Railroad Association of St. Louis (TRRA) and the Alton and Southern Railway Company (A&S). The primary reasons for taking this approach were the following:

- These Class II carriers operate the major existing common yard facilities within the study area;
- Except for New Yard, the majority of the proposed yard facilities would be expansions of the existing facilities operated by these carriers;
- The scope of operations of these carriers is limited to the St. Louis area, with its specific geographic, climatic, and railroad operational characteristics; and
- Historical cost data which were relatively uniform, reliable, and readily available in the form of Annual Reports (Form R-2) submitted by these carriers to the ICC.

The only major drawback in using this approach was that the cost data provided in the R-2 Reports were not exceedingly detailed. However, through the use of data from other published sources and additional data supplied by the carriers, it was possible to develop cost data of a sufficient level of detail and accuracy for use in this study.

In general, the methodology employed in the estimation of yard operating costs was based upon previous studies conducted for the Transportation Systems Center (TSC) of the U.S. Department of Transportation and the Federal Railroad Administration and uses costs developed from the ICC Accounts of the TRRA and the A&S. This methodology encompassed all activities and cost categories related to yard operations, which were:

- Maintenance of Way (MOW);
- Maintenance of Equipment (MOE);
- Transportation (switching costs);
- General and Administrative Expenses (G&A);
- Equipment Capital Costs (locomotives); and
- Car-Hire Costs.

Actual dollar figures and operating statistics associated with the above activity/cost categories or accountes were obtained from the 1978 R-2 Reports of the TRRA and the A&S and from information supplied by SEK.

The specific procedures followed for the estimation of yard operating costs in each of the major activity/cost accounts are summarized below. Exhibit 3.27 presents the yard operating unit cost factors derived and employed in these costing procedures.

Maintenance of Way

For the estimation of Maintenance of Way (MOW) costs, the actual experience of the TRRA and A&S was used. From the 1978 R-2 Reports of these carriers, it was determined that the TRRA and A&S expenditures for maintenance of roadway were $11,796 and $11,659 per mile of switching track, respectively. These two rates were weighted by the number of miles of track represented by each and combined to yield a composite

Exhibit 3.27: Yard Operations Unit Cost Factors

Activity/Cost Account	Unit Cost Factors	Applied Overhead %	Cost Behavior
Maintenance of Way	$12,867/Track Mile/Year	45	Fixed
Maintenance of Equipment			
Locomotive Maintenance	$4.46/Locomotive Unit Hour	44	Variable
Car Inspectors	$11.64/Car Inspector-Hour	44	Variable
Transportation (Switching)			
Fuel Cost	$ 5.653/Locomotive Unit Hour	85	Variable
Engine Crews	$49.90/Crew Hour	85	Variable
General And Administrative	.057 X (MOW + MOE + TRANSP.)	--	Variable
Locomotive Replacement Capital	$53,223/Locomotive Unit/Year	--	Variable
Car-Hire	$ .307/Car Hour	--	Variable

average of $11,751 per track-mile. This 1978 figure was adjusted to 1979 dollars using the Indexes of Railroad Material Prices and Wage Rates, published by the AAR Economics and Finance Department, January 30, 1980.* The 1979 adjusted annual cost per track-mile was $12,867.

There were costs involved with the MOW category other than the direct cost of roadway maintenance. These costs which were associated with MOW but not included in roadway (running and switching track) maintenance consisted of:

- Maintenance of structures (i.e., office buildings, shops, roads, fences, etc.);
- Administration;
- Casualties and insurance;
- Depreciation expense; and
- Other expenses.

The nature of the engineering work in this study, for the planned yards, was that track geometry information was available but not in detail on all of the structures and support facilities. Hence, it was not possible to accurately estimate their operating costs individually. However, it was reasonable to assume that these costs as a group were directly related to the size or scale of yard operations, of which miles of yard trackage was a significant indicator. Therefore, these other costs were estimated as a percentage of roadway maintenance. The cost of these items in 1978 equaled 43 percent and 49 percent of roadway maintenance for the TRRA and A&S, respectively, with the combined percentage being 45 percent.

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*In this case and all others, U.S. average indexes were used as inflators. The grouped indexes for "Material prices, wage rates and supplements combined (excluding fuel)" were used to adjust all cost categories except fuel, which was adjusted separately using the specific fuel indexes.

Total annual yard maintenance of way costs, then, were estimated as follows:

- The total number of track-miles for each yard were determined from engineering data supplied by SEK;
- The number of track miles were multiplied by the roadway maintenance unit cost of $12,867/track-mile/year to yield annual maintenance of roadway cost;
- Annual maintenance of roadway cost was multiplied times 0.45 to give an estimate of the other associated costs per year; and
- The annual cost of roadway maintenance and associated costs were summed to determine total annual MOW costs for the yard.

The various "build" alternatives involve changing main track speed limits, replacing jointed rail with continuous welded rail on corridors and in yards, increasing the weight of rail on corridors, and using heavier rail in the newly constructed portions of yards.

Since these changes are known to have effects on maintenance costs, the base maintenance cost derived above was adjusted using American Railway Engineering Association Equated Mileage Parameters as appropriate for each yard.*

Maintenance of Equipment

The primary maintenance of equipment (MOE) cost in the yards were those for yard locomotives and car inspectors, assuming that the actual car repair costs were billed directly to their owners. All other equipment maintenance costs were comparatively small and were assumed to be a direct function of the primary MOE costs, with the following exceptions: depreciation - accounted for in equipment capital costs; equipment rents - generally accounted for in car-hire costs; and repair and maintenance of cars - billable to car owners. Therefore, MOE costs were arrived at by directly determining the costs associated with locomotive maintenance and car inspectors, estimating other MOE costs as a percentage of these primary costs, and summing to yield total MOE cost for a yard.

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*American Railway Engineering Association, Manual for Railway Engineering, Washington, D.C., 1980, pp. 22-4-1 through 22-4-3.

The initial step taken in the estimation of MOE was to develop unit cost bases for the estimation of locomotive maintenance costs and the cost of car inspectors. The base chosen here was locomotive unit hours, since this operating statistic was considered to be a direct determinant of locomotive maintenance costs and was both available from the R-2's and from the yard simulation model output. From the 1978 R-2 Reports, it was determined that TRRA spent $1,411,000 on locomotive maintenance and accumulated 337,019 unit hours ($3.74/hour), while the A&S, with a locomotive fleet one-third the size of the TRAA's, spent $629,000 and accumulated 123,020 unit hours ($5.11/hour). The weighted composite unit cost of the two roads for 1978 was $4.07/locomotive unit hour, which when adjusted to 1979 dollars became $4.46/locomotive unit hour. The cost of car inspectors was based on the average hourly rate for this class of employee, as documented by SEK. The 1979 hourly rate for car inspectors, including 35 percent fringe benefits, was $11.64. Finally, the combined percentage for all other MOE costs, relative to the primary costs, was 44 percent.

To estimate the total MOE cost associated with the daily operations of a particular yard, the following general procedure was followed:

- The number of locomotive unit hours and car inspector hours per day, required for yard operations, were determined from the yard simulation output (Conrail Yard Model);
- Locomotive maintenance costs were calculated by multiplying the number of locomotive unit hours by the locomotive maintenance unit cost factor of $4.46 per locomotive unit hour;
- Car inspector costs were calculated by multiplying the number of car inspector hours by the average hourly rate, including fringe benefits, for car inspectors of $11.64 per hour;
- Locomotive maintenance and car inspector costs were summed and multiplied by 0.44 to estimate the overhead costs associated with MOE; and
- Total MOE cost was then the sum of locomotive maintenace, car inspector, and overhead costs.

Transportation (Switching)

The primary transportation costs which could be directly estimated as a result of yard operations were the costs of yard switch engine fuel and crews. The average cost of railroad diesel fuel in 1978 was $0.3794 per gallon, from AAR estimates,* which when inflated to 1979 price levels became $0.5653 per gallon. The average fuel consumption of a standard switch engine has been estimated by TSC to be 10 gallons per hour. This yielded an average hourly fuel cost of $5.563/locomotive unit hour. The average consumption figures for TRRA and A&S, estimated from R-2 Report data, were 9.48 gallons/hour and 10.73 gallons/hour, respectively, so the 10 gallons/hour TSC estimate seemed applicable to the St. Louis Terminal area. The hourly cost for each member of a switch crew in 1979 was established by SEK. From SEK data, the percentages of four and five man switch crews, 15% and 84% respectively, were determined. Using this data, the weighted average crew cost was calculated as $37.06/hour. When fringe benefits were included, the rate became $49.90/hour.

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*The Association of American Railroads, Economics and Finance Department, Statistics of Railroads of Class I in the United States, 1968-1978, Washington, D.C., 1979.

Several smaller cost accounts which were related to transportation but not directly accounted for in fuel or crew costs consisted of the following:

- Administration;
- Other yard expenses;
- Specialized services;
- Administrative support operations;
- Loss and damage;
- Casualities and insurance; and
- Other expenses.

The costs resident in these accounts, because they were individually small and not directly determinable, were considered as overhead on the primary accounts of fuel and crews. The expenditures of the TRRA and A&S for the sum of the above accounts were calculated and taken as a percentage of the total expenditure on fuel and crews to yield an applicable overhead rate for transportation. The combined overhead rate on fuel and crew costs for the TRRA and A&S was 85 percent.

The procedure for estimating total daily transportation costs associated with the operations of a particular rail yard was as follows:

- The number of locomotive unit hours and engine crew hours required in yard operations was determined from the yard simulations;

- Fuel cost was calculated as the number of locomotive unit hours times the average hourly cost of consumed fuel ($5.653/hour);

- Crew costs were arrived at by multiplying the number of engine crew hours by the average hourly crew cost of $49.90;

- Overhead was calculated as 85% or 0.85 times the total of fuel and crew costs; and

- Total transportation cost was the sum of the costs associated with fuel, crews and overhead.

General and Administrative

General and administrative expense (G&A) was estimated as a percentage of all other costs accounted for above. The combined G&A percentage rate calculated from the R-2 reports of the TRRA and A&S was 5.7 percent. Thus, G&A expense associated with yard operations was determined by multiplying the sum of MOW, MOE, and transportation costs times 0.057. However, before calculating G&A, all of these costs had to be converted to a common base of annual dollars.

Equipment Replacement Capital

The only major yard operating equipment capital cost not accounted for in the preceeding cost accounts was the cost of owning a switch locomotive. This particular cost was determined separately.

The average 1979 cost of a four-axle switch engine was $460,000, as supplied by the Electro Motive Division of General Motors Corporation. The average life expectancy was estimated to be 20 years with a 10% salvage value at the end of the useful life. The total amount to be capitalized over 20 years was the purchase price ($460,000) less the present value of the salvage ($6,854), assuming an interest rate of 10%, which equaled $453,146.* The capital recovery factor for this investment, over 20 years at 10% interest, was 0.11746.** When the capital recovery factor was applied to the amount to be capitalized, an equivalent annual payment of $53,223 resulted.

The annual locomotive replacement capital costs associated with the operation of a particular yard were estimated by determining the number of physical locomotive units required to be on-hand at the yard, per the yard simulations, and multiplying that number by the equivalent annual payment of $53,223.

Car-Hire

Car-hire or per diem costs, while not necessarily a direct cost of yard operations, are considered to be important operating costs which can be heavily influenced by yard operations. This is the case, since car-hire charges for the use of other roads' cars by a particular railroad are assessed primarily on the basis of time and thus the time spent by rail cars in a yard has a cost associated with it. Even in cases where a railroad is using its own cars, and is not explicitly billed for car time, that railroad is bearing an opportunity cost in the sense that

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*A 10% interest or discount rate was used here, since this is the rate specified by U.S. DOT in Discount Rates to be Used in Evaluating Time-Distributed Costs and Benefits, Order DOT 5000.1.

**The formula used to calculate the Capital Recovery Factor (CRF) was

$$CRF = \frac{i}{1-(1+i)^{-n}}$$

where i = the interest or discount rate; and
n = the number of periods, in this case, years.

the cars being detained in the yards can neither be used elsewhere in the railroad's network nor hired out to other roads to generate revenues. Therefore, car-hire costs are included as a part of yard operating costs in the evaluation of the overall yard operations cost picture and the eventual analysis of the cost effectiveness of operations.

The AAR Labor Management Task Force documented the average car-hire cost and the average elapsed time per car handled in the St. Louis Terminal area, which were $12.05 and 39.2 hours respectively. Dividing the average cost by the average elapsed time yielded an average car-hire cost of $.307 per car-hour. This average cost per car-hour was then multiplied times the total number of car-hours of detention time associated with the daily operation of a yard, as determined from the yard simulations, to yield the daily car-hire costs related to yard operations.

Annualization of Costs

All costs which were calculated on a daily basis (MOE, Transportation and Car-Hire) were annualized by multiplying by a factor of 270. This annualization factor was used because the traffic moving through the terminal area on the Study Day (March 30, 1979), and simulated in operations analyses of yards and corridors, represented 1/270 of the total traffic or car volume moving through the St. Louis Terminal Area in the year 1979. Since the costs calculated on a daily basis were largely dependent upon operating factors which varied primarily with car volume (i.e.: locomotive unit hours, engine crew hours, car inspector hours, etc.), it was assumed that, on average, the ratio of estimated daily to annual costs for these accounts would be approximately the same as the ratio of daily to annual car volume.

Total Annual Yard Operating Costs

After all costs had been annualized, the total annual operating cost for a particular yard was calculated as the simple sum of the annual costs for the six activity/cost accounts. That is:

Total Cost = MOW + MOE + Transportation + G&A + Equipment
Replacement Capital + Car-Hire

Because it was necessary to determine operating costs for a large number of yards and years, which themselves encompassed the operations of a great many individual railroads, the actual mechanics of the above described yard cost methodology were performed with the aid of a computer. This involved the application of a relatively straightforward accounting type program which, employing the basic algorithms described for this methodology, calculated and tabulated the operating costs associated with the various yards, years, and railroads being analyzed.

The results of CONSAD's yard operations cost analysis for each yard alternative and year have been summarized and are presented in Appendix E.

In addition to estimating costs for yards as operating units, operating costs for each yard were allocated among the various railroads whose traffic was handled in the yard. The general basis for the allocation of these costs among roads was their usage of the facilities, with the actual process of cost allocation being conducted as a part of the previously mentioned computer accounting program. This type of cost allocation enables the individual railroads involved in the restructuring study to evaluate the cost impacts of implementing various restructuring alternatives on their own particular operations within the area.

3.5.2 Corridor Operations Costing

The development of system costs by Class I railroads was the general approach selected for use in the estimation of corridor operating costs for the various restructuring alternatives. These system costs are required to be submitted by all Class I railroads to the ICC on an annual basis and in a uniform system of accounts. Also, the railroads are required to report annual operating statistics (train-miles, train-hours, etc.) related to these costs. This approach entailed the gathering of both the railroad system cost data from the annual reports (Form R-1) of all the railroads involved and their related operating statistics.

The major criteria for the selection of a cost data source were reliability of cost factors and operating statistics, uniformity in accounting procedures, and availability of data. This approach satisfied these three criteria: permitted data to be accumulated in a reasonable period of time; allowed historical cost analysis; and was readily applicable to the St. Louis project.

The overall cost methodology applied under this approach consisted of ten basic steps, as diagrammed in Exhibit 3.28 and outlined briefly below.

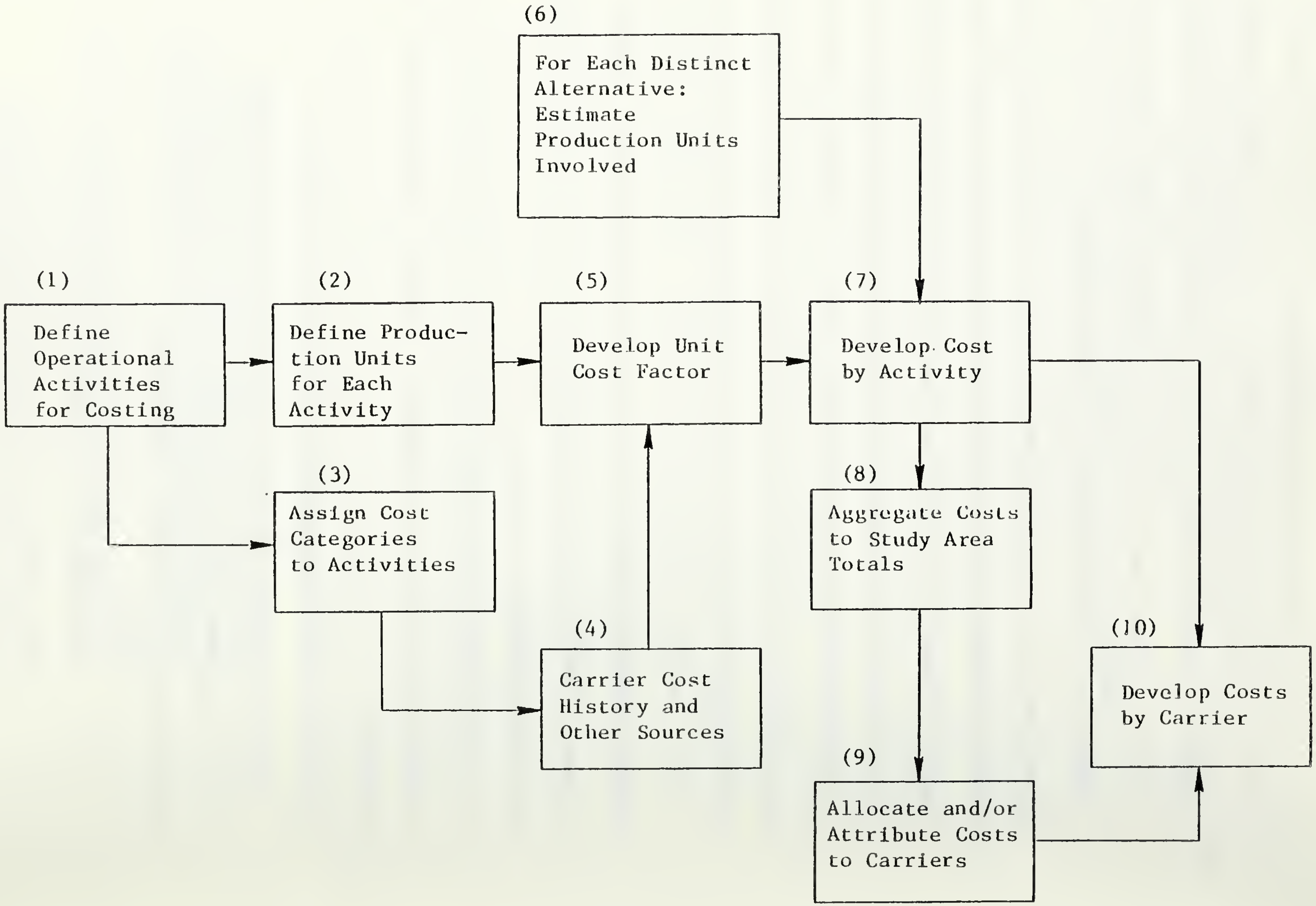
1. Define Operational Activities for Costing -

   A series of six activity accounts which applied specifically to corridor operations was defined. These were: Maintenance of Way; Maintenance of Equipment; Equipment Capital or Replacement Cost; Transportation, Administrative Cost (G&A) and Car Costs.

2. Define Production Units for Each Activity -

   Each activity account was broken down into one or more factors of production units causally related to the activities. These factors were: Track-Miles; Gross Ton-Miles; Train-Miles; Engine Hours; and Car-Hours.

Exhibit 3.28: Costing Approach Used for the Estimation and Assignment of Corridor Operating Costs


(1)
Define Operational Activities for Costing
(2)
Define Production Units for Each Activity
(3)
Assign Cost Categories to Activities
(4)
Carrier Cost History and Other Sources
(5)
Develop Unit Cost Factor
(6)
For Each Distinct Alternative: Estimate Production Units Involved
(7)
Develop Cost by Activity
(8)
Aggregate Costs to Study Area Totals
(9)
Allocate and/or Attribute Costs to Carriers
(10)
Develop Costs by Carrier

3. Assign Cost Categories to Activities -

Operating cost categories, in the form of ICC cost accounts from R-1 Reports, were assigned to the various units of production within each activity. The cost categories assigned to each activity were selected so as to reflect the total cost for the activity they represented. The few cost categories which were not assigned to an activity did not specifically relate to operations in St. Louis, and accounted for less than 1% of total railroad operating expense. Exhibit 3.29 details these cost category assignments.

4. Develop Composite Carrier Cost Histories And Other Cost Sources -

Composite carrier costs were developed for the various activity accounts by summing the dollar values associated with each of the cost categories assigned to an activity across 12 Class I line-haul railroads operating in the Gateway and then summing the totals for each category within each activity to arrive at a composite activity cost. The twelve railroads were: The Baltimore and Ohio, Burlington Northern, Chicago and Northwestern Transportation Co., Illinois Central Gulf, Louisville and Nashville, Missouri Pacific, Missouri-Kansas-Texas, Norfolk and Western, Rock Island, St. Louis-San Francisco, Southern, and Southern Pacific. Conrail, the thirteenth Class I railroad involved in the study, was excluded from this calculation due to limited availability of cost data for this road and some extraordinary costs incurred by the corporation during and immediately after its reorganization which were not representative of normal operations. The costs used in the calculation of the composite were obtained from the railroads' R-1 Reports to the ICC. Composite costs were developed for a four year period. All of these costs were then adjusted to 1979 dollars, using the Indexes of Railroad Material Prices and Wage Rates - Railroads of Class I, published by AAR Economics and Finance Department, January 30, 1980.* These adjusted composite costs were then summed to yield four year composite costs in 1979.

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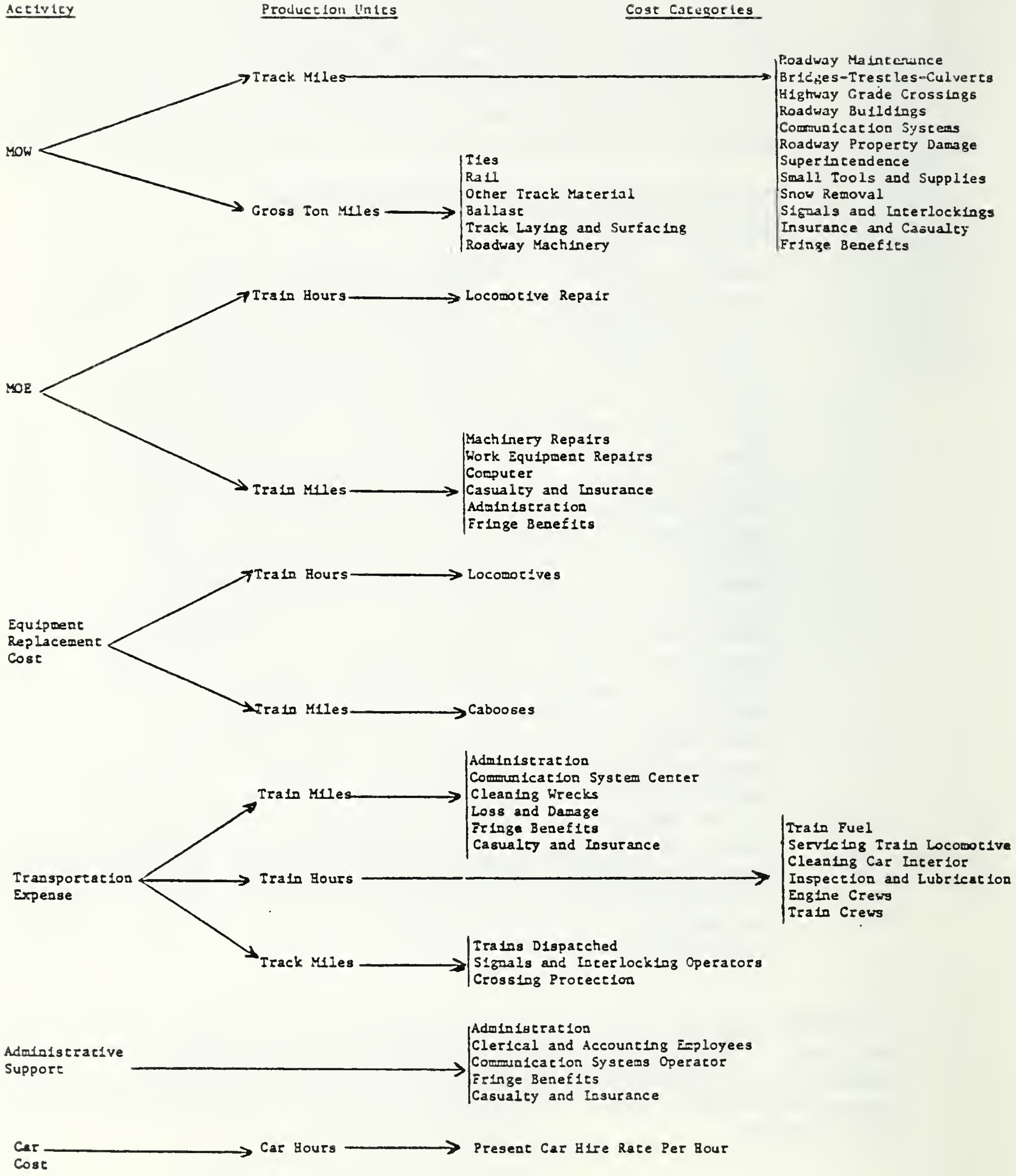
*U.S. average indexes, rather than District averages, were used as inflators. The grouped indexes for "Material prices, wage rates and supplements combined (excluding fuel)" were used to adjust all cost categories except fuel, which was adjusted separately with the specific fuel indexes.

Exhibit 3.29: Corridor Cost Category Assignments



5. Develop Unit Cost Factors -

The initial step taken in the development of unit cost factors was the assembly of composite operating statistics or production units related to the composite costs described in step 4. Four year composites of the operating statistics of the twelve railroads were determined in a manner similar to that for operating costs, using data acquired from Financial and Operating Statistics for Class I Railroads, published by the ICC, for the years in question. The composite carrier costs were then divided by the relevant composite production units within each specific activity to derive costs per production unit for those activities. Exhibit 3.30 presents a summary of these derived unit cost factors for each of the six activity accounts.*

The only exceptions to these procedures were the following:

- Equipment Replacement Costs
  - Locomotive Replacement Cost was derived from the average 1979 cost of six axle locomotives, the average life expectancy and average expected salvage value provided by the Electro-Motive Division of General Motors Corporation, La Grange, Ill. Using a Capital Recovery Factor calculation, an equivalent annual payment per locomotive was determined. This annual payment was then divided by the average composite hours of service per locomotive unit per year to yield the unit replacement cost per locomotive hour;
  - Caboose Replacement Unit Costs were derived in the same manner as locomotive replacement unit costs, using cost information presented in "Budget Planning in 1979", Railway Age, November 27, 1978; and
- Car-Hire Costs for the area were provided by the AAR Labor Management Task Force. An average car-hire cost per car-hour was calculated by dividing the average car-hire cost per car handled in the Gateway by the average elapsed time, in hours, for car movements through the Gateway.

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*The unit cost factors derived from the four year composites, presented in this exhibit and eventually applied in the corridor cost methodology, were compared with unit costs derived for each of the individual years and the differences between the adjusted single and four year composites were found to be insignificant, indicating a stable historical cost-production unit relationship.

Exhibit 3.30: Corridor Operations Unit Cost Factors

Activity/Cost Account	Unit Cost Factors	Cost Behavior
Maintenance of Way (MOW)*	$3,442/Track Mile/Year	Fixed
	$ .00093/Gross Ton Mile	Variable
Maintenance of Equipment (MOE)	$42.76/Train Hour	Variable
	$ .79/Train Mile	Variable
Transportation	$210.64/Train Hour	Variable
	$ 2.57/Train Mile	Variable
	$666.56/Track-Mile/Year	Fixed
Administrative (G&A)	.075 X (MOW + MOE + TRANS.)	Variable
Equipment Replacement Capital	$ 25.96/Locomotive Unit Hour	Variable
	$ 3.30/Caboose Hour	Variable
Car - Hire Cost	$ .307/Car Hour	Variable

*The AREA Equated Mileage Parameter adjustment cited in Section 3.7.1 Yard Operations Costing, was made to "build" alternative corridor MOW costs.

6. Estimation Production Units Involved for Each Alternative and Year -

   The estimated daily production units (track-miles, train-miles, etc.) for each alternative and year were either taken directly or derived from the results of CONSAD's corridor simulations/operations analyses.

7. Develop Costs by Activity -

   The unit costs derived for each activity were applied to the estimates of daily units of production associated with each activity for each alternative and year to yield activity costs per day.

8. Aggregate Costs to Gateway Corridor Totals -

   The daily costs for each activity, under each alternative and year, were summed to yield total daily operating costs for the corridor network. These total costs, along with the costs by activity, were annualized by multiplying the daily costs by a factor of 270. (See Section 3.5.1 Yard Operations Costing.)

9. Allocate and/or Attribute Costs to Carriers -

   Road-specific corridor operational costs (car-hire costs, equipment replacement costs, equipment maintenance, etc.) were directly attributed to specific carriers based on their own individual operations. However, the common costs of operating shared facilities (maintenance of way and structures) could not be directly traced to specific carriers and had to be allocated among the various carriers based on their usage of these facilities (corridor segments) measured in terms of the numbers of cars and gross ton-miles.

10. Develop Costs by Carrier -

    This involved the accumulation of both directly attributable and allocated costs of each carrier to provide estimates of total annual corridor operating expense for the specific carriers involved. This was done for each restructuring alternative and year and provided a basis for comparing the relative cost impacts of the various alternatives on the corridor operations of individual railroads.

In order to perform steps six through ten of this analysis, CONSAD developed a computer cost accounting program. This program, as has already been indicated, utilized input data files developed from the simulations/operations analyses of the corridor network under each of the various restructuring alternatives and years. Specifically, these input files consisted of the following operating data for each train moving over the corridor network:

- Train name;
- Train type;
- Number of cars;
- Number of locomotives;
- Total gross tons;
- Operating railroad;
- Corridor segments traversed;
- Running times for each segment;
- Train delays for each segment; and
- Train miles (length) for each segment.

This information was used to calculate and tabulate the operating statistics in the form required by the costing methodology. The program accumulated the necessary operating statistics by corridor segment, per the operations analyses segment definitions, and also by railroad. The associated unit costs were then applied to these operating statistics to determine operating costs for each corridor segment and railroad, in each of the six activity accounts (MOW, MOE, etc.). These accounts were summed to yield total operating expense for each segment and railroad. The program then summed the operating costs across all segments to give operating costs of the entire corridor system for each activity account and the total. Additionally, average per train and per car operating costs were calculated for each corridor segment and railroad, by dividing total operating costs determined for the segments or railroads by the number of trains or cars associated with each.

The final output of this program consisted of corridor operating costs and operating statistics summarized by corridor segment and railroad, along with corridor system totals. This information was provided for all restructuring alternatives and years under study, enabling comparisons to be made among them, and served as a basis for analyzing the relative cost effectiveness for the various alternatives.

The detailed data resulting from this corridor operating cost analysis is presented in Appendix F of this report.

3.5.3 TOFC Operations Costing

The general approach followed in the estimation of operating costs for the proposed common intermodal (TOFC) facility was that of zero-based costing. The primary reasons for pursuing this approach were:

- No large common facility of this type that could be used as a model for cost estimation, exists in the U.S.;
- Relatively little published data concerning railroad TOFC operations and costs is available; and
- Due to the tremendous diversity of TOFC operation and the significant differences in costs associated with these operations, the development of cost estimates had to be tailored to the specific type of operation contemplated.

This approach involved the development of costs from "ground level", starting with a work force, and associating with it costs necessary to perform operational functions. Cost of supplies, materials, fringe benefits and other expenses were also grouped into their respective operational function. The costs associated with each operational function were determined at a 1979 levels. Material, supply and equipment costs were derived by using estimates from number of suppliers. Wage rates and benefits were established based on railroad operations in the St. Louis area. Other costs were furnished from either suppliers and contractors, or from regional averages if the former were not available.

In actuality, TOFC operations involve two related but distinct types of activity. These are (1) rail operations and (2) trailer handling operations. Rail operations encompasses all activities and costs associated with the handling of rail cars in the facility, which include:

- Maintenance of way and structures;
- Maintenance of equipment involved in the movement and handling of rail cars (i.e.; switch engines, car inspection, etc);
- Transportation or switching of rail cars (i.e.; receiving, classification, and departure of cars or trains);
- Locomotive capital costs;
- Flatcar costs related to yard detention time; and
- G&A expense associated with the rail operations.

Trailer handling operations included all activities and costs specifically involved with the movement and handling of trailers within, into, and out of the facility, including:

- Loading and unloading of trailers to and from flatcars;
- Movement of trailers from the loading/unloading point (pad) to the appropriate lot or storage area;
- Activities associated with the highway movement of trailers into and out of the facility (gate activity);
- Maintenance and capital costs of all equipment required to carry out the above operations;
- The wages and benefits for the employee force required to perform these operations; and
- G&A expense associated with the handling of trailers.

Because rail operations at the TOFC facility were roughly similar to those at other classification yards, this portion of the TOFC operating costs was estimated using the same general methodology applied to common classification yard operations, as described in Section 3.5.1 A zero-based approach was then employed for the estimation of the portion of operating costs related to trailer handling operations, which accounted for roughly 80% of total TOFC operating costs. The remainder of this section deals with the development and application of this zero-based cost methodology.

Estimation of Required Force

The force, in terms of both equipment and personnel, required to effectively conduct trailer handling operations at the proposed TOFC facility was determined from the results of CONSAD's TOFC operations analysis (See Working Paper No. 21). In general, this force consisted of the following:

- Equipment
    - Overhead cranes;
    - Spotting tractors;

- Personnel
  - Crane operators;
  - Spotting tractor drivers;
  - Operating support personnel (spotters and tie-down men);
  - Inspection personnel;
  - Clerical personnel;
  - Administrative support;
- Related Interchange Requirements
  - Draymen charges.

Association of Costs with Activity Accounts

Having determined the make-up of the force required for trailer handling operations, it was desirable to associate the costs, resulting from that force, with the major types of activity conducted in the TOFC facility. In order to remain consistent with the cost estimation for the other common facilities (yards and corridors) the various trailer handling operations costs were associated with the six basic activity accounts (MOW, MOE, Transportation, Equipment Capital, G&A, and Car Costs) with which the operating costs in those other facilities were associated. The association of specific trailer handling costs with activity accounts was as follows:

- Maintenance of Way
  - No costs were associated with this activity. since all MOW costs involved with TOFC operations were included in the MOW determined for rail operations;
- Maintenance of Equipment
  - Crane maintenance costs;
  - Spotting tractor maintenance costs;
  - Inspection personnel wages and fringe benefits;
- Transportation
  - Crane operator wages and fringe benefits,
  - Spotting tractor driver wages and fringe benefits,
  - Operating support personnel wages and fringe benefits,

  - Fuel costs for cranes and spotting tractors,
  - Clerical personnel wages and fringe benefits,
  - Drayman charges for interchange to non-common railroads;

- G&A
  - Administrative support personnel and related costs; and

- Car Costs
  - No costs were associated with this account, since flatcar costs were accounted for in the rail activity costs and questions involving trailer ownership, functions, and costs made it impossible to accurately assess costs of this type.

Determination of Costs by Activity/Cost Account

Knowing what specific types of trailer handling costs were to be associated with each activity or cost account, it was possible to determine the overall trailer handling operations costs for each of these accounts. This was accomplished by estimating the operating costs resulting from the force associated with each account and summing these costs to arrive at an estimate of total trailer handling costs which could be attributed to each of these major activity/cost accounts.

The procedures followed in the determination of operating costs for the activity/cost accounts, relevant to trailer handling operations, are briefly described below.

Maintenance of Equipment

The primary costs associated with maintenance of equipment were crane and spotting tractor maintenance and trailer inspector wages and fringe benefits. The average maintenance costs for cranes and spotting tractors were determined from information provided by suppliers of these pieces of equipment. On average, cranes were estimated to accrue maintenance costs at the rate of $0.75 per lift, where a lift is considered to be the loading or unloading of a trailer onto or off of a flatcar. Based on supplier's estimates, the average spotting tractor is expected to show a maintenance cost of 11.6 percent of its original purchase price per year for its average useful life of five years. Given the 1979 average price of spotting tractors of $38,000, the average yearly maintenance cost was calculated as $4,408. The average rate for inspectors, wages and fringes, was considered to be the same as that previously employed in the analysis of classification yard operations, which was $11.64/hour.

Annual maintenance of equipment costs were then determined as follows:

- The number of crane lifts, spotting tractors, and inspector hours per year required for trailer handling operations were determined from the results of CONSAD's TOFC operations analysis;
- Crane lifts were multiplied times $0.75/lift to yield crane maintenance cost;
- The number of spotting tractors was multiplied times $4,408/year to yield spotting tractor maintenance costs;
- Inspector hours were multiplied by their hourly rate of $11.64 to yield inspection costs;
- An overhead rate of 44 percent was applied to the sum of the above primary maintenance costs to account for ancillary costs related to but not explicitly included in these costs. This overhead rate was the same as that applied to MOE in the costing of other common yards, since it was believed that the relationship between primary MOE and related costs for both

rail and trailer handling operations should be approximately the same; and

- Finally, total MOE costs were determined by summing the costs estimated for cranes, spotting tractors, inspectors and overhead.

Transportation

The primary costs associated with transportation were the wages and fringe benefits of operating personnel (crane operators, spotting tractor drivers, and support personnel) and clerical personnel, the costs of fuel, and drayman charges for highway interchange to non-common roads. The operating personnel requirements related to the operation of a crane were determined to be the following:

- One crane operator;
- One crane spotter;
- One tie down man; and
- Five spotting tractor drivers.

This eight man crew was assumed to be made up of Teamster Union members whose average 1979 rate, including fringe benefits, was estimated as \$16.105 per hour, based on information supplied by the Teamsters Union. The average hourly rate for each crew was eight times this rate or \$128.84. The average rate for clerical personnel was determined to be \$12.66 per hour (\$101.25/day) in wages and fringe benefits, from information gathered on this class of railroad employee in this area. Hourly fuel costs for cranes and spotting tractors were based on average fuel consumption figures for these types of equipment and the average 1979 cost of diesel fuel of \$0.5653 per gallon. Average fuel consumption for cranes is 2.5 gallons/hour of service, based on manufacturers' estimates, which resulted in a fuel cost of $1.413/hour of service. Average fuel consumption of spotting tractors was derived from the equipment fuel allowances provided in IDOT's Schedule of Annual Equipment Ownership Expense, January 1980, which yielded a consumption rate of 6.54 gallons/hour of service and a cost of $3.695/hour of service. The drayman charge assessed for each non-common road highway interchange was $35; which was the average minimum cost for such services, as indicated by area TOFC operators.

Annual transportation costs, associated with trailer handling operations, were then determined in the following general manner:

- The number of crane crew hours, crane and spotting tractor service hours, clerical personnel hours, highway interchanges with non-common roads, all on an annual basis were determined from the results of the TOFC operations analysis;

- The appropriate cost factors were applied to each of the above operating statistics,
    - crane crew hours x $128.84/hour for labor,
    - crane hours x $1.413/hour for fuel,
    - spotting tractor hours x $3.695/hour for fuel,
    - clerical personnel hours x $12.66/hour for labor,
    - non-common highway interchanges x $35/interchange,

  to yield the annual transportation costs associated with each;

- An overhead rate of 32 percent was applied to the cost of crane operating crews and fuel, in order to account for other costs related to those primary costs. This overhead rate was based on the 85 percent overhead calculated for engine crews and fuel in the yard costing analysis (Section 3.7.1) less the portion of that overhead represented by clerical personnel costs, which have been calculated separately in this case; and

- Finally, total annual transportation cost was calculated as the sum of crane crew, fuel, clerical personnel, non-common highway interchange, and overhead costs.

General and Administrative

The costs, associated with administrative support, represented in this account were estimated as a percentage of MOE costs and Transportation costs for fuel and operating personnel (i.e.; crane operators, spotting tractor drivers, tie down men, and crane spotters). The G&A percentage applied here was identical to that for rail operations, which was 5.7 percent. Thus, G&A was estimated by summing MOE costs and the Transportation costs associated with operating personnel and multiplying by .057.

Equipment Capital

The only major equipment replacement capital costs associated with trailer handling in the TOFC facility were those for the overhead cranes and the spotting tractors. The average 1979 cost and average useful lives were provided by manufacturers or suppliers of these pieces of equipment and a salvage value equal to 10 percent of the original costs of the equipment was deemed reasonable. In all cases, the cost of capital or interest rate was assumed to be 10 percent. From this information, equivalent annual payments for this equipment were determined using a standard capital recovery factor, calculated as described in Section 3.5.1.

The average cost of an overhead crane in 1979 was $450,000 and the expected life was 10 years. The total amount to be capitalized was the purchase price ($450,000) less the present value of the salvage ($17,354), which equaled $432,646. The capital recovery factor for this investment was 16277, which when applied to the amount to be capitalized yielded an equivalent annual payment of $70,421. The average 1979 cost of a spotting tractor was $38,000, with an expected life of five years. The capital recovery factor was .26392 and the amount to be capitalized was $35,640 ($38,000 purchase price less the present value of an assumed 10 percent salvage value at the end of the useful life), yielding an equivalent annual payment of $9,406.

Equipment capital costs related to trailer handling operations were then determined as follows:

- The number of cranes and spotting tractors required were estimated from the results of the TOFC operations analysis;
- Annual crane capital cost was calculated as the number of cranes times the annual payment per crane of $70,421;
- Annual spotting tractor capital cost was equal to the number of spotting tractors times the annual payment per unit of $9,406; and
- Total annual equipment capital cost was the sum of the annual capital costs of cranes and spotting tractors.

Exhibits 3.31 and 3.32 present summaries of the operational parameters and unit cost factors employed in the estimation of TOFC operating costs, for rail and trailer handling operations, respectively.

Total Annual Operating Costs

Total annual operating costs for the TOFC facility were arrived at by first adding the costs determined for both rail operations and trailer handling operations, within each of the six activity/cost accounts, to acquire account totals for the facility as a whole; and then summing these account totals to yield the grand total of all TOFC operating costs for the year and alternative analyzed. A summary of the results of this TOFC operating cost analysis may be found in Section 4.3, TOFC Service.

Exhibit 3.31: Operational Parameters and Unit Costs Used in TOFC Rail Operations Costs

Activity	Parameters	Value of Parameters 1985	2000	Unit Cost Including Overhead and Fringes
Track Maintenance	Track-Miles/Year	24.3	24.3	$18,657/Mile/Year
Locomotive Maintenance	Unit Hours/Day	24	32	$6.41/Unit Hour
Car Inspection	Inspector Hours/Day	31	36	$16.76/Inspector Hour
Locomotive Fuel	Gallons/Day	240	320	$1.04/Gallon
Switch Crews	Crew Hours/ Day	24	32	$92.46/Crew Hour
Locomotive Ownership	Units/Day	1	1	$197.12/Locomotive
Car Hire	Car Hours/Day	3355	6088	$0.35/Car-Hour

Exhibit 3.32: Operational Parameters and Unit Costs Used in TOFC Trailer Handling Casting

Activity	Parameters	Value of Parameters 1985	Value of Parameters 2000	Unit Cost Including Overhead and Fringes
Gate Clerks	Clerk Hours/Day	21	33	$12.66/Clerk Hours
Office Clerks	Clerk Hours/Day	21	65	$12.66/Clerk Hours
Rubber Interchange	Interchanges/Day	193	346	$35/Interchange
Crane Crews (Operator, Spotter, Drivers (5), Tie Down Man)	Crew Hours/Day	72.13	112.37	$128.84/Crew Hour
Crane Fuel	Crane Hours/Day	72.13	112.37	$1.86/Crane Hour
Crane Maintenance	Lifts	1494	2701	$0.75/Lift
Crane Replacement	Number of Cranes	8	12	$70,421/Crane/Year
Spotting Tractor Replacement	Number of Tractors	40	60	$9406/Tractor/Year
Spotting Tractor Fuel	Tractor Hours/Day	360.65	561.85	$3.70/Tractor Hour
Spotting Tractor Maintenance	Number of Tractors	40	60	$4408/Tractor/Year

As in the cases of the other common facilities, TOFC operating costs were also allocated among the various railroads involved with the proposed common TOFC facility. Again, these allocations of operating costs to individual railroads were based on the roads' projected usage of the facilities and services encompassed by this type of operations.

3.5.4. Common Transfer Costs

One significant operating cost is not accounted for in the cost of operations determined for the common facilities. This was the cost associated with transfer crews and equipment involved in train operations within the study area which were not comprehended in the yard and corridor simulation processes. These costs include the idle time that transfer crews and equipment spend waiting in yards between their runs and being transported from one assignment to the next. Because the number of transfer train movements varies significantly between restructuring alternatives, the costs associated with these operations would also vary; and thus it was necessary to estimate these costs in order to develop an accurate overall cost picture for common operations related to the various restructuring alternatives.

SEK, as part of their analysis of labor requirements, developed estimates of the number of transfer crew hours required for common operations under each of the restructuring alternatives. Based on this information and the knowledge of traffic make-up and transfer train movements, CONSAD was able to develop estimates of the cost of of these common transfer operations for each alternative. Costs, related to these transfer operations, were estimated in four of the six activity/cost accounts, namely, MOE, Transportation, G&A, and the Equipment Capital. The costs in the remaining two accounts, MOW and Car Cost, had already been accounted for in the costing of the common yards and corridors or were to be included as a portion of the costs associated with home road operations.

The general procedures followed for the estimation of these common transfer costs were as follows:

1) The amount of time transfer trains or crews spent running on corridors, per the corridor operations analyses, was deducted from the SEK crew hour estimates, since this portion of transfer operations and costs were reflected in corridor operations costs, to yield the estimated number of crew hours not yet accounted for;

2) Crew hours were translated into locomotive unit hours by multiplying them by the average number of locomotive units per transfer train;

3) Knowing crew hours and locomotive unit hours, it was then possible to estimate operating costs in each of the four activity/cost accounts, by applying the appropriate portions of the methodology developed for the costing of common yard operations, as described in Section 3.5.1; and

4) Total operating costs for these transfer operations were arrived at by summing the costs for each individual account, determined on either a daily or annual basis.

The estimation of costs was conducted for each of the major common switching entities (TRRA, A&S, New Yard, and TOFC), as well as for the St. Louis Terminal Area as a whole, under each alternative restructuring plan. As with other common operating costs, the cost of these common transfers was allocated among the line haul roads, in relation to the involvement of their traffic in common transfer movements.

3.5.5 Related Home Road Operating Costs

The primary focus of CONSAD's operations and cost analyses, throughout the study, has been the common facilities and services within the St. Louis Terminal Area. The operational and cost impacts resulting from the restructuring of common facilities and operations will have a significant impact upon the costs of several individual roads' operations within the terminal. It was, therefore, necessary to make estimates of the magnitude of these costs, under each of the restructuring alternatives, in order to accurately assess the overall cost impacts and measure the cost effectiveness of implementing any one of the proposed alternatives.

This was accomplished by using the SEK estimates of the labor force required in the year 2000 under each alternative. Annual cost factors, which included wages, fringe benefits, material and suppliers, were applied to the labor force estimates to determine MOW, MOE, Transportation, and G&A (labor-based costs). The number of switch locomotives each road required for its own operation was estimated based on the labor data to determine equipment capital costs. Car detention was drawn from CONSAD's traffic data to determine car hire cost. Where an individual road's facilities are part of the "common" operation, the estimate described above was reduced by the amount estimated for that common facility (e.g., ICG's line between Q Tower and Valley Jct. is part of the common corridor system).

These estimates are based on broad-based average cost factors applied to the estimated labor forces, solely to determine the order of magnitude change resulting from operations under any one of the restructuring alternatives.

Specifically:

- The average annual labor expense for an employee, per the SEK labor report, is $27,283. The average ratio of total operating expense to labor operating expense for the TRRA an A&S for 1978, from the R-2 Reports, is 1.57. Thus, the total labor based operating expense was determined by multiplying the number of employees by $27,283 and then by 1.57, and allocated among the MOW, MOE, Transporation, and G&A accounts based on the average percentage each is of the total combined TRRA/A&S operating expense.
- The estimated number of switch locomotives was multiplied by the capital recovery cost calculated for switch engines ($53,223 per year) to determine Equipment Capital Cost.
- The estimated annual car detention hours from CONSAD traffic data was multiplied by the average car hire rate ($.307 per hour), to determine annual car-hire cost.

3.5.6 System Operating Costs

In evaluating the impact or effectiveness of a restructuring alternative with respect to operating cost, the most significant cost figure is that for the study area as a whole. Through the use of CONSAD's costing methodologies, operating costs, both in total and for each of six separate activity/cost accounts, for each operating unit within the various components (yards, corridors, etc.) of the terminal system were estimated. Because the operating cost estimates for all of the various operating units were in a consistent format, all with costs estimated for the same six activity/cost accounts and in 1979 dollars, the development of component and system costs was a straight-forward matter of addition.

The system costs for the terminal area under any of the restructuring alternatives were then arrived at using the following two step procedure:

1) The costs estimated for each operating unit (i.e. individual yards, corridor segments, etc.), in each activity/cost account and in total, within a component of the System (i.e. yards, corridors, etc.) were added together to yield component totals; and

2) Operating costs for each of the defined operational components of the system (yards, TOFC, corridors, transfers and home roads) were summed to yield system cost totals for each activity/cost account and a grand total of all estimated operating costs within the St. Louis Terminal Area, all in 1979 dollars.

As a result of this process, CONSAD was able to provide cost data at three basic levels of detail, that of individual operating units, operational components of the system, and the system as a whole, for each of the alternatives and years analyzed. Also, costs, at each level of detail were determined for each of the six major activity/cost accounts, as well as operating totals. All of this permitted comparisons of costs between restructuring alternatives at both gross and relatively fine levels of detail and allowed differences in overall cost to be traced to specific operating units, components or activities.

Total system costs for each individual railroad within the system were also determined. System costs for railroads were arrived at in roughly the same manner as described above, using the portion of the costs of each common operating unit allocated to each road and the estimated home road costs for each road as the bases from which to begin aggregating costs.

3.5.7. Attribution and Allocation of Operating Costs

As has been mentioned throughout the discussion of operations costing, the determination of operating costs for each individual railroad involved in the restructuring effort, under each of the various restructuring alternatives and years analyzed, has been an important consideration. This was the case for two major reasons:

1) The cost impacts of restructuring on individual railroads were necessary to measure, in order to aid the railroads involved in evaluating the various restructuring alternatives from their own perspectives since effective implementation of any restructuring plan would require the cooperation of most or all parties involved; and

2) The operating costs and/or cost savings estimated for each road, under a particular restructuring alternative, could possibly serve as a basis from which to assess an equitable portion of the capital costs of construction, related to implementing that alternative, to be borne by each road, or to determine the level of user charges that would be appropriate.

The development of road by road operating costs involved two general types of cost determination. These were:

- Cost Attribution - The direct tracing of costs to a specific cost center, in this case a railroad, whose existence or functions were the exact cause of those costs being incurred and who was then solely responsible for those costs; and

- Cost Allocation - the distribution of costs, not directly traceable or attributable to specific cost centers, on the basis of some measure which was believed to approximate the actual cause and effect relationships governing cost.

The types of costs which were attributable to specific roads were those resulting directly and exclusively from that roads' operations. Examples of these types of costs included:

- Car-Hire costs;
- Road train crew, equipment maintenance fuel and equipment capital costs; and
- Home yard and other home road costs.

The types of costs which had to be allocated among the road were those costs associated with the operation of common facilities and the provision of common services, which were incurred by roads as a group. Examples of these types of costs included:

- Common yard and corridor MOW;
- Common yard, MOE, Transportation, Equipment Capital and G&A; and
- Common transfer costs.

Operating costs determined for each road, whether for an operating unit, operational component or system totals, were the sum of each roads attributed and allocated operating costs. These road by road operating cost estimates were developed at the same level of detail as the cost estimates for the various operating units. That is, costs were attributed and/or allocated to roads within each of the six major activity/ cost accounts, as well as for operating cost totals. The specific procedures followed in the allocation of costs for each of the major operational components, yard, TOFC, corridor, transfer, and home roads are described below.

Common Classification Yards

In the common yards, all operating costs, except car-hire cost, were allocated among the roads on the basis of the number of inbound and outbound car handlings for the various roads at each yard. Car-hire cost for each road in each common yard were directly attributed on the basis of the total car-hours of detention time amassed by each road at a particular yard, per the results of CONSAD's yard operations analyses.

In order to allocate the remaining yard operating costs, the number of inbound and outbound (I/O) car handlings performed for each road in a yard and the percentage of total yard I/O car handlings which they represented were determined from CONSAD's detailed block to block traffic movement data associated with the yards. Conceptually, this involved viewing the movement of a car through a yard as a two part operation, an inbound handling and an outbound handling. The costs resulting from the switching or interchange of a car were considered to be split equally between the inbound and outbound handlings, and the roads associated with each, because the inbound and outbound roads involved in switching or interchange of a car were perceived to benefit equally from this type of activity. For example, if a car were to be interchanged from road x to road y in a yard, road x would have received one I/O handling (inbound) and road y one I/O handling (outbound), with half of the associated operating costs allocated to road x and the other half to road y. Thus, once the number of I/O handlings for each road and total yard I/O handlings had been determined for any particular yard, the operating costs for that yard, excluding car-hire, were allocated to each road based on the percentage of total yard I/O handlings accounted for by each road.

It should be noted here that the I/O handlings associated with a road included not only the cars arriving and departing on that railroad's trains, but also the cars associated with the railroad's operations that were moving into and out of the yards on scheduled transfer trains operated by one of the three common switch carriers (A&S, TRRA, and New Yard). This was important for proper cost allocation, since it assured that virtually all operating costs were allocated to the proper "line-haul road" whose traffic was being handled; and avoided the problem of having significant costs allocated to the terminal and switching carriers, which are generally vendors rather than consumers of car handlings and whose operating costs would eventually be borne by the line-haul roads in the form of terminal charges.

The actual mechanical process of allocating yard operating costs was conducted by computer, as was mentioned previously in Section 3.5.1.

Common TOFC

The costs of operating the common TOFC facility were allocated among the eight participating roads, utilizing the same basic allocation procedure applied for the other common classification yards. The only difference being that I/O trailer handlings, rather than car handlings, were employed as the allocation base, since the primary function of such a facility was to handle trailers and the vast majority of operating costs were directly associated with trailer handling activity.

Common Corridors

The majority of costs associated with operations on the common corridor network were directly attributable to individual trains of specific rail carriers. The two types of corridor cost which were not attributable, and thus were necessary to allocate among the various carriers, were MOW costs and all costs related to the operation of common transfer trains over the corridor network.

The MOW cost for each link of the corridor network had been estimated on both the basis of track-miles making up the link and gross tons traversing the link. MOW as a factor of track-miles was allocated among the roads on the basis of the percentage of a link's total car volume represented by each road's car volume on the link. MOW as a factor of gross ton-miles was allocated among the roads based on the percentage of a link's total gross ton-miles accounted for by each road's traffic. A road's allocated portion of total MOW for any link was the sum of its allocated portions of MOW as a factor of track-miles and gross ton-miles. Total common corridor MOW for any road was then the sum of its allocated portions of MOW for all links composing the common corridor network.

The costs in each activity/cost account, associated with the movement of common transfer trains (A&S, TRRA and New Yard) over the corridor network were allocated among the roads involved, based on the percentage of cars on these transfer trains which were identified with each road. This allocation was conducted on a train by train basis, for all common transfers moving over the corridors, since the corridor costs and consists for each transfer train were somewhat different.

A road's total common transfer train corridor cost was then calculated as the sum of its allocated portions of the corridor costs associated with each common transfer.

By suming the attributed and allocated corridor costs, a reasonable estimate of total corridor costs to be borne by each road was determined.

Common Transfers

The cost of equipment, fuel, crews and administration resulting from common transfer train activity had been estimated for each of the major terminal switching carriers. These costs, in turn, then had to be allocated among the roads whose traffic made up those transfer trains. This was accomplished by determining the number of each road's cars carried on transfers of each common switch carrier and the percentage of the total number of cars transferred, by that switch carrier, accounted for by each road. The common transfer costs for each switch carrier were then allocated among the roads based on this percentage of transferred cars. A road's total allocated common transfer cost was equal to the sum of its allocated portions of each common switch carrier's transfer costs (A&S, TRRA and New Yard).

Home Road Operations

All costs estimated for a road's home operations were directly attributed to that particular railroad. No allocation of costs was required in this instance, because these home road operating costs were easily traceable to specific railroads and, in fact, had been estimated separately for each individual road's operations.

System Operating Costs by Road

System operating cost totals were developed for each individual railroad, as has been described in section 3.5.6, System Operating Costs. Summaries of operating costs by road, for all alternatives and years studied, were provided to the appropriate individual railroads and IDOT for review. These summaries were presented, separately for each road, operating costs in each of the six activity/cost accounts and total operating costs for individual operating units (Gateway Yard, Madison Yard, etc.), operational components of the system (yards, corridors, transfers, etc.) and system totals.

4.0 RESULTS

Each of the restructuring alternatives described in Section 2.0 has been analyzed under projected year 1985 and year 2000 traffic volumes, utilizing the methods described in Section 3.0. The results are presented in this chapter.

The first to be described is the No Build Alternative. It describes railroad operating conditions under the assumption that traffic growth occurs but there are no changes in study area facilities or operating patterns. This is followed by the presentation of results of analyzing the Build Alternatives. In those sections, results for each of the Build Alternatives are shown and compared with the No Build Alternative. The reader is cautioned that the No Build Alternative used for comparison has been defined for analytic purposes only and care should be taken in interpreting the values derived for that case.

4.1 No Build Alternative

4.1.1 Setting

One of the first steps in the analysis of a proposed change in rail operations is to determine what the effect is of making no change. In the case of the St. Louis MARGE Study, the planning horizon year 2000 was chosen for design purposes, and an additional horizon year 1985 was selected to provide an intermediate point for evaluation of alternatives.

The scheme of operations under each of the Build Alternatives in each of the horizon years is possible to define with some accuracy, since the facilities, strategies, and traffic loads were developed interdependently and collectively with respect to the corporate entities operating in the study area. The members of the RTAC have stated that adoption of one of the Build Alternatives would enable each road to move close to their own established corporate goals with respect to St. Louis area operations.

Definition of a realistic set of parameters to describe the conditions that would prevail if none of the Build Alternatives was chosen was somewhat more difficult. CONSAD polled the RTAC members regarding changes in current operations they felt would likely occur between commencement of this study and the horizon years 1985 and 2000. The results of this poll were discussed in detail at the March 31, 1979 RTAC meeting, and CONSAD was directed to consider the pattern of operations in the study area in the years 1985 and 2000, for analytic purposes, to be the same as those in the year 1979, except for traffic volumes.

The RTAC was aware, based on historical precedent, that there most probably would be changes between 1979 and 1985 or 2000. For example, three major merger/acquisition/control applications were pending when this study commenced (BN & SLSF, LN & BO, SSW & CRIP Tucumcari Line), and two more major applications had been filed (MP & UP; NW & SOU) during the study.* This indicates the large number of possible patterns of study area rail operations that may develop by the year 2000. In the face of such uncertainty, the use of the current patterns, as suggested by the RTAC, was considered to be the most reasonable alternative.

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*Additionally, there were merger discussions between the SP and ATSF.

At no time during the study has the possibility of a single-line major new construction (e.g., a new hump yard as distinguished from conversions of old yards, or a new Mississippi River Bridge) seemed likely. The trend in constructing new hump yards seems to be to construct within an existing rail network (e.g., ATSF Argentine, SP Colton, ATSF Barstow, UP North Platte and Hinkle, SOU Linwood), since this offers the maximum opportunity to use the yard for different purposes as traffic and priorities change. The major carriers which depend on the use (internal to their own systems) of the Mississippi River bridges at St. Louis (NW and MP) have access to other trans-Mississippi bridges (e.g., Hannibal, Illmo).

The average detention time of traffic through the study area at present is in the range of 35 to 45 hours, depending on conditions. This is viewed as unacceptably high by railroads and many of their customers, and is a cause for traffic to be routed around St. Louis and to be diverted to other transport modes. As traffic levels increase in future years, the railroads must be expected to expend great effort to keep the level of detention at St. Louis at or below current levels. A longer detention time would probably result in even greater shifts to barge and truck transportation, would reduce capital productivity of railroad equipment, and would require expenditures in additional railroad equipment which would be unnecessary if St. Louis were to be operated more efficiently.

4.1.2 Operations Under No Build

As has been noted above, present study area operations are considered by most knowledgeable parties to be inefficient and unacceptable, with conditions only getting worse in the future as traffic increases. It is believed that the capacity of some of the key elements of the study area will be exceeded under projected traffic levels, given current operating strategies. However, the sum total switching capacity of all the yards in the study area will not be exceeded, since there are several TRRA yards currently closed or significantly underutilized, and most home yards are underutilized.

Thus, the analysis of the No Build Alternative was slightly different than that of the Build Alternatives, with appropriate caveats as to interpretation of the results.

In the computer-based simulation of the No Build Alternative, CONSAD found that Madison Yard could not handle the projected Year 2000 load of 1,954 cars to be switched. In order to effectively assess the capacity of Madison under No Build conditions, the number of inbound trains was reduced to the point where the yard would function in the model. This point was reached at 1,707 cars, which was achieved by removing three trains that originated at Carrie Avenue. Based on CONSAD's knowledge of the St. Louis-E. St. Louis Terminal Area's operation, it was hypothesized that, had this situation occurred in operations on the TRRA, the management of TRRA would have elected to switch these 247 cars at Carrie Avenue, or would have reopened CD Yard. This would allow the cars to be classified into road line cuts, but unblocked for movement out on road trains. For example, if the 247 cars would contain 50 cars for Conrail, those cars could be assembled at either Carrie Avenue or CD and delivered to Rose Lake, Conrail's home yard. At Rose Lake, the 50 cars would be switched again into blocks for movement to Conrail Enola, Avon, Conway, and Buckeye Yards. If the 247 cars had been switched at Madison Yard, most, if not all, of the cars would have left the study area in a train with one less yard handling and one less transfer move.

Such a series of events would not happen to just an isolated group of cars under Year 2000 traffic loads for the No Build Alternative. Such events, involving additional handling by the line-haul concerns, would occur frequently to almost all groups of cars. If this were not to occur, the car would be held at the entrance to a common yard. The resulting queue would not diminish until the level of traffic subsided, and as long as the backup existed, it would hamper corridor operations since the trains can only be held on corridor trackage.

The result of multiple car handlings would be to increase the car handling costs for the line-haul carriers.

The queuing of trains awaiting yard entry would cause excessive delays for other traffic, late and unreliable local industry switching service, and high costs due to low productivity of both labor and capital. Such a situation would cause the managements of the line-haul carriers and/or the Federal Government to take actions to relieve congestion.

The actions which may be taken by the Interstate Commerce Commission include embargo of traffic through the study area. The actions which may be taken by rail line managements include reopening currently inactive yards in the study area, increasing switching activity in yards in or out of the study area to reduce switching loads at overburdened facilities in the study area, and rerouting cars so that they do not pass through the St. Louis area. The options that any individual line-haul carrier would have would be limited only by the individual carrier's resources, and in making investment decisions, the system benefits to each carrier would be the major determinant for each capital investment involved.

The application of Year 2000 traffic levels to the current study area operations would be the congestion described above. In all probability, the solution would be for each carrier to reduce its switching load to a point where the current facilities could handle the volume somewhat efficiently. This would be done by preblocking inbound trains, shifting outbound blocking requirements to interior system yards, and exploiting direct connections where possible. The first two options, which effectively amount to shifting the switching load to interior system points, involve yard activity several hundred miles from St. Louis, for example, at Indianapolis, Indiana (Avon), Cincinnati, Ohio (Queensgate), and Kansas City, Missouri (Neff). Of course, each of these points may already be somewhat congested.

The option of direct connections has, to some degree, already been exploited. For example, the SOU and BN have a run-through train interchanged at Centralia, and CR and MP have a physical connection at St. Elmo, Illinois, which has the potential for similar exploitation, as does the B&O and MP connections at Salem, Illinois.

If such efforts failed to alleviate Year 2000 levels of congestion, the carriers which could interchange or route traffic through another railroad gateway would do so. This rerouting implies additional cost to the carriers involved, since it can be fairly assumed that, if the cost of other routes were less, the traffic would probably be moving over those other routes at present.

The fact that the roads involved currently use study area facilities to the extent they do, suggests that the congestion problem cannot be solved operationally (i.e., a solution will require capital investment somewhere). The magnitude of each roads' investment in facilities and local industry traffic suggests that St. Louis will continue to be a significant terminal for most lines in the foreseeable future.

Furthermore, congestion at St. Louis and the set of costly measures required to reduce its impact on transit time will retard the potential of the nation's railroad system to increase its modal share of long distance traffic. The shift of traffic from more costly and energy-consuming modes to railroads is seen by many to be in the nation's best interests.

The subject of traffic originating and terminating in the St. Louis-E. St. Louis switching district presents the carriers with a somewhat different problem. When traffic originates or terminates in the switching district on a road other than the line-haul carrier which handles it into or out of the switching district, a switch charge is assessed against the line-haul carrier. The dollar value of that charge is $153.21 for the Alton and Southern and $203.58 for the Terminal Railroad Association of St. Louis as of July 1, 1980. This charge makes it somewhat unattractive for line-haul carriers to serve industries on switch lines and the result is that, where possible, line-haul carriers tend to encourage industry to locate, or relocate, on lines served by a line-haul. This is consistent with the move of industries from urban areas to more rural areas, and is especially true in the St. Louis-E. St. Louis area, where several large industrial concerns, for one reason or another, have abandoned operations or relocated to rural areas. An example is the relocation of activities at the General Motors Assembly Plant in St. Louis (on the TRRA) to Bowling Green, Kentucky, and Wentzville, Missouri (on line-haul routes).

One of the factors most rail-using industrial firms consider in evaluating their rail service is service reliability. The increasing congestion in the study area due to Year 2000 traffic levels will tend to decrease reliability of rail service to local industries. Coupled with the other economic and technical pressures on industry in general, the continuing increase in cost and decrease in reliability for increasing traffic levels will create more impetus for the movement of industries out of St. Louis.

In summary, the options open to each line-haul road under the No Build Alternative are those in which each road will either commit additional operating resources within the study area (the assumption utilized in analyzing the No Build Alternative), or commit additional operating resources outside of the study area, or make capital investments within or exterior to the study, all of which may be accompanied by strategies and priorities. Each road will be evaluating these options only with respect to its own position. To the extent that each road is able to make the capital investments, or operating strategy changes it desires, it will be able to reduce the impacts of Year 2000 traffic. Such actions may not be beneficial to other affected roads. Thus, what one road does to improve its position may worsen the position of another road.

The evidence that such changes have occurred in the past is strong. For example, in 1972 TRRA lowered its trackage rights charge to N&W for movement between Granite City and Madison and Luther Yards, which allowed N&W to close NKP Madison and Wabash Brooklyn. In 1974, TRRA commenced operation of a hump yard at Madison, which required use of the Merchants Bridge approaches for the hump engine tail track, thus interfering with the N&W trains, as well as others. In 1972, as part of the A&S Gateway Yard expansion program, the connection between Gateway and the Willows corridor at Valley Jct. was double tracked, and most MP traffic through Dupo began to move via A&S through Valley Jct. Since the ICG-GMO merger in 1973, ICG has consolidated operations at former ICG Valley Yard, reducing operations at Venice. Each of these changes has tended to increase congestion at Valley Jct. The challenge of the MARGE project has been to develop improvements in St. Louis which are beneficial to the overall movement of traffic and which do not impede individual carrier operations, in the face of increasing traffic volumes.

4.2 Build Alternatives

Each of the Build Alternatives, Two-Yard Directional, Three-Yard Directional, and Three-Yard Bidirectional, was analyzed in the detail explained in Section 3.0 for operations and costs in the years 1985 and 2000. The same analyses were conducted for the No Build Alternative for the years 1979, 1985, and 2000. Comparisons of the various Build Alternatives' measures of operating and cost efficiency with the No Build measures for comparable years provides a basis for evaluation of the merits of the various alternatives, although this should only be done with caution. Measures developed for the No Build Alternative in 1979 cannot be compared with the several Build Alternatives' 1985 and 2000 measures without recognizing that the differences in traffic levels distort the comparisons. Comparison of 1979 No Build measures with 1985 and 2000 No Build measures is useful to the extent that it provides some insights into the probable results of not going ahead with one of the Build Alternatives, a subject which has been discussed at some length in the preceding section and thus will not be considered in detail here.

4.2.1 Time Through the Study Area and Reliability of Operations

Transit time is an extremely important issue in railroading since it determines how far in advance goods must be shipped, hence, what amount of goods must be enroute at all times. Longer transit times also require a larger investment in freight cars. A larger investment in rail cars decreases the amount of capital available for other investments. Thus, an improvement in transit time accomplishes two significant things: it reduces the quantity of goods enroute from producer to consumer, and potentially reduces the investment in freight car fleets necessary to maintain adequate service.

Reliability is also a major issue in railroading, which, with transit time, has been noted as a major factor in determining modal choice by shippers and receivers. Many producing industries depend upon a sure flow of supplies in and products out in order to maintain steady and efficient production. In recent years there has been a trend away from maintaining large and costly inventories and a much closer linkage between producers at the several stages of production. To a large extent, this has been made possible by the rapid improvement of truck transport using the interstate highway system. Trucks can operate point-to-point, without the numerous intermediate handlings inherent in railroad operations and thus can usually provide higher levels of reliability in service.

With rising energy costs, and the recognized need to improve productivity throughout the American economy, there may be an opportunity for railroads to recapture a larger share of freight traffic. However, if speed of delivery and reliability by railroad are at unacceptable levels, shippers may elect to pay the higher price of truck transport in order to obtain delivery on time.

With these facts in mind, in defining and analyzing the alternatives for the St. Louis Terminal, a great deal of emphasis was placed on reducing the time required for and improving the reliability of handling traffic in the system.

The sample of OD Pairs described in Section 3.4 was used to develop measures of transit time. Transit time is defined, for the purpose of this analysis, as the elapsed time between the entry of a car into the study area (or movement from a local industry) and the exit of that same car from the study area (or delivery to a local industry). The complete movement of each OD Pair was examined to determine the transit time. The resulting weighted average transit time for each alternative in the year 2000 is shown in Exhibit 4.1. The Exhibit 4.1 transit times expected for each alternative were derived assuming that cars moved through the study area in accordance with their _de facto_ schedules. These figures represent the car movements expected if the schedules used on the study day are maintained and thus would be the same for both the years 2000 and 1985. These figures do not include any delay that might result from unreliability of operations under the various alternatives. (The subject of delay due to unreliable operations will be examined later in this section.)

It must be noted here that, at the specific request of the RTAC, inbound and outbound train schedules maintained by the roads under baseline conditions (March 1979) were assumed to be maintained through the year 2000. From an analytical point of view, this assumption makes the evaluation of the change caused by the implementation of one of the Build Alternatives more straightforward, since the schedules are a potential variable that was held constant. The rationale used by the RTAC in making this request was that each road's own system operation is geared to the schedules in and out of St. Louis to some degree. In

Exhibit 4.1: Average Base Time Through the Study Area (Year 2000)

Alternative	Average Base Time Through the Study Area (Hours)*	Change Vs. No Build (Hours)	Percent Change Vs. No Build
No Build	39.5	-	-
Two-Yard Directional	31.5	- 8.0	-20.3
Three-Yard Directional	28.7	-10.8	-27.3
Three-Yard Bidirectional	24.3	-15.2	-38.5

*Does not include delay resulting from unreliability of operations.

turn, however, it must also be noted that the individual road's own internal schedules are, in part, a result of St. Louis area operations. The conclusion, therefore, is that if a Build Alternative were implemented (i.e., physical construction completed and operating strategy adopted), the schedules of individual railroads would probably be changed to reflect the changed availability of traffic for outbound movement, and the changed ability of the study area facilities to accept inbound traffic.

The application of the methodology for estimating missed connections, described in Section 3.4, produced the results shown in Exhibit 4.2. It should be noted that the number of cars potentially not meeting schedule under each of the Build Alternatives is significantly less than the number of cars potentially not meeting schedule in the No Build Alternative for comparable years, with the fewest cars failing to meet schedule in the Three-Yard Bidirectional Alternative.

If a car fails to meet its schedule due to being bad-ordered, held, or mishandled, it is reasonable to assume it will be delayed at least 24 hours. If a car fails to meet its schedule due to the failure of the outbound train or transfer to operate, the car will probably move on the next scheduled train out of the yard. To determine the impact of failure to operate as scheduled the number of times each classification is scheduled to be run out of each yard daily, and the number of cars in that classification were assembled for each alternative, and the weighted average delay of moving on the next later train was computed. These delay figures were applied to the numbers of cars delayed

Exhibit 4.2: Results of Reliability Calculation on a Daily Basis

Year	Alternative	Total Cars Entering	Car Entering to Switch	Number of Cars Not Meeting Schedule: Due to Bad Order, etc.	Number of Cars Not Meeting Schedule: Due to Trains Not Run	Number of Cars Not Meeting Schedule: Total	Percentage of Cars Switched Meeting Schedule	Percentage of All Cars Meeting Schedule
1979	No Build	9000	6930	642	1708	2350	66	74
1985	No Build	10610	7920	734	1952	2686	66	75
2000	No Build	16960	11020	1021	2716	3737	66	78
1985	Two-Yard Directional	10610	7920	560	1619	2179	72	79
2000	Two-Yard Directional	16960	11020	797	2235	3032	72	82
1985	Three-Yard Directional	10610	7920	564	1568	2132	73	80
2000	Three-Yard Directional	16960	11020	786	2194	2980	73	82
1985	Three-Yard Bidirectional	10610	7920	495	1358	1853	77	83
2000	Three-Yard Bidirectional	16960	11020	689	1982	2671	76	84

for each reason and total car-hours of delay and average delay per car delayed were computed for each alternative. The results of these computations are presented in Exhibit 4.3.

It is useful to measure the effect of improved reliability (or lack of same) on the transit time under each alternative. This was accomplished by adding the estimated car-hours of the delayed cars to the car-hours associated with the average transit time as given in Exhibit 4.1, and dividing by number of cars entering the system to be switched. The results are shown in Exhibit 4.4. These results indicate, as would be expected, that the difference among the alternatives in average transit time increases significantly when the effect of reliability on transit or detention time is taken into account.

In addition to measuring the magnitudes of transit time through the study area and delays resulting from unreliability of operations, the distributions of transit times were examined. The standard deviation about the mean transit time, including delay due to unreliability, was determined for the cars in the sample OD Pairs (see Section 3.4) under each alternative.

The results of this analysis for the Year 2000 are presented in Exhibit 4.5. The standard deviations shown in this exhibit represent measures of the spread of the distribution of transit times, which is considered to be a measure of the reliability or uniformity of operations. The smaller the standard deviation, the less spread out or more compact the distribution of transit times and the higher the implied

Exhibit 4.3: Total and Average Delay Due to Unreliability Incurred by Cars Switched in the Study Area (Year 2000)

Alternative	Total Car-Hours of Delay for Cars Switched*	Change Vs. No Build (Hours)	Percent Change Vs. No Build	Average Car-Hours of Delay Per Car Switched	Change Vs. No Build	Percent Change Vs. No Build
No Build	88,780	-	-	19.1	-	-
Two-Yard Directional	62,182	-26,598	-30.0	16.8	- 2.3	-12.0
Three-Yard Directional	63,266	-25,514	-28.7	17.3	- 1.8	- 9.4
Three-Yard Bidirectional	67,378	-21,402	-24.1	20.2	1.1	5.8

*Based on an average of 24 hours of delay for mishandled cars and the following average time intervals between the departure of identical destination blocks from the classification facilities for cars missing their scheduled outbound train:

No Build	17.2 hours
Two-Yard Directional	14.2 hours
Three-Yard Directional	14.9 hours
Three-Yard Bidirectional	18.9 hours

Exhibit 4.4: Time Through Study Area Adjusted to Account for Reliability (Year 2000)

Alternative	Percent Cars Delayed	Average Hours Delay for Cars Delayed	Average Delay Per Car Switched (Hours)	Base Time Through Study Area (Hours)	Adjusted Time Through Study Area (Hours)
No Build	34	19.1	6.5	39.5	46.0
Two-Yard Directional	28	16.8	4.7	31.5	36.2
Three-Yard Directional	27	17.3	4.7	28.7	33.4
Three-Yard Bidirectional	24	20.2	4.8	24.3	29.1

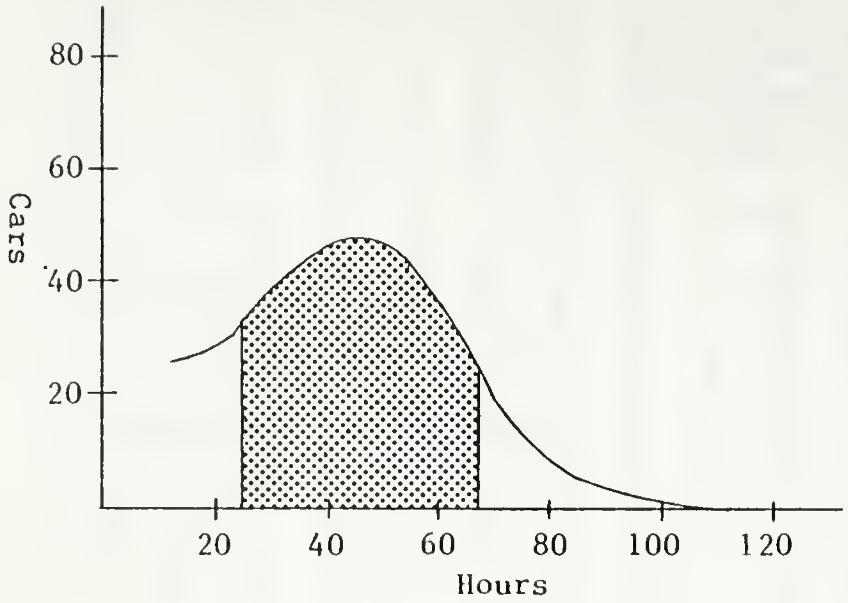
Exhibit 4.5: Standard Deviation of Transit Time Through the Study Area for Cars Switched (Year 2000)

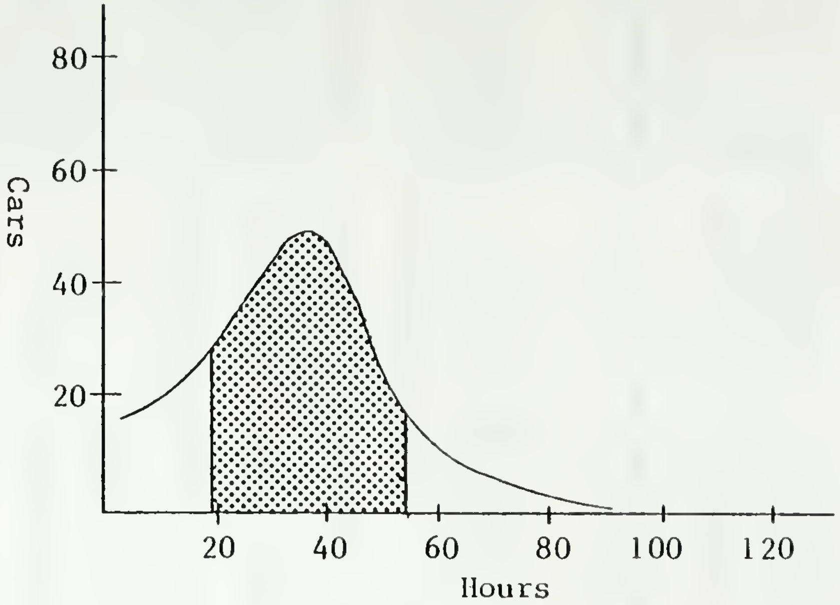
Alternative	Mean Transit Time	Standard Deviation of Transit Time
No Build	46.0	21.3
Two-Yard Directional	36.2	17.2
Three-Yard Directional	33.4	17.0
Three-Yard Bidirectional	29.1	14.7

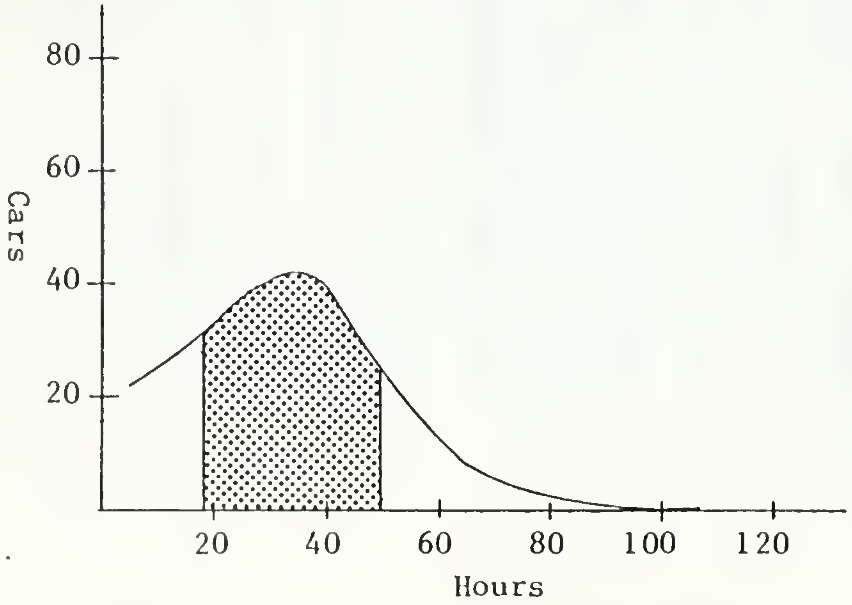
level of reliability. In general, the standard deviation may be defined as the number of units of measurement (in this case hours) on either side (plus or minus) of the mean or average measure (mean transit time) within which approximately two-thirds of the data points (rail cars) fall. For example, the No Build Alternative has a mean transit time of 46.0 hours and a standard deviation of 21.3 hours. This indicates that approximately two-thirds of the cars switched in the study area under the No Build Alternative would have a transit time of 46.0 ± 21.3 hours, which would be from 24.7 to 67.3 hours, a range of 42.6 hours within one standard deviation. Exhibit 4.6 shows the graphic representations of the transit time distributions for each alternative, with the shaded area under the curves representing the portion of the distribution within one standard deviation of the mean. This should help to clarify this concept of standard deviations of transit time distributions.

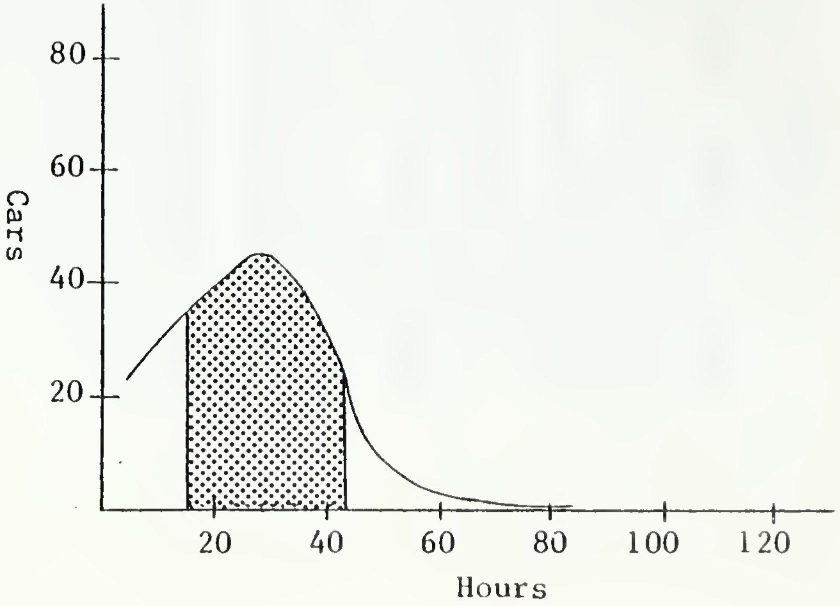
From Exhibits 4.5 and 4.6, it can be seen that the transit time distributions of all three Build Alternatives have lower means, smaller standard deviations and are less spread out than the No Build transit time distribution. This indicates that both the speed and reliability of operations under the Build Alternatives would be greater than under the No Build Alternative. Making the same types of comparisons among the three Build Alternatives shows that of the three alternatives the Three-Yard Bidirectional provides the best performance.

Exhibit 4.6: Distribution of Transit Time Through the Study Area (Year 2000)


No Build Alternative


Two-Yard Directional Alternative


Three-Yard Directional Alternative


Three-Yard Bidirectional Alternative

The adoption of any of the Build Alternatives also reduces the number of times that cars are handled in the study area. This reduction in handlings is, in large part, responsible for the increases in reliability described above.

The brief summary of handlings per car under each alternative presented in Exhibit 4.7 shows that the Three-Yard Bidirectional Alternative results in the greatest decrease in handlings, with the two Directional Alternatives (Three-Yard and Two-Yard) showing approximately equal improvements when each is compared to the No Build Alternative.

4.2.2 Cost Through the Study Area

In Section 3.5, the methodologies employed in the estimation of railroad operating costs within the study area were described in detail. The results of the estimation and analysis of operating costs are presented in this section of the report. All operating cost figures here have been computed and are presented in constant 1979 dollars.

Summaries of the operating costs computed for each alternative and year are given in Exhibits 4.8 (1985) and 4.9 (2000). Two facts become apparent when the costs of operations are compared. The first is that substantial benefits, in the form of reduced total operating costs, occur in the implementation of any of the three Build Alternatives with respect to the No Build Alternative. The second is that the major reduction in operating costs occur in the so-called home roads' facilities, as opposed to the common facilities, which can be readily seen from a comparison of the distributions of operating costs, between common and home facilities, summarized in Exhibit 4.10. The reason for

Exhibit 4.7: Summary of Car Handlings (Year 2000)

Alternative	Total Car Handlings Per Day	Change Vs. No Build	Percent Change Vs. No Build	Handlings Per Car Switched	Change Vs. No Build	Percent Change Vs. No Build
No Build	23,445			2.13	-	-
Two-Yard Directional	18,046	-5,399	-23	1.64	-0.49	-23
Three-Yard Directional	17,824	-5,621	-24	1.62	-0.51	-24
Three-Yard Bidirectional	15,503	-7,942	-34	1.41	-0.72	-34

Exhibit 4.8: Annual Operating Cost ($000) for the Year 1985

Alternative	Operating Unit Type/Name	Maintenance of Way	Maintenance of Equipment	Transportation	Equipment Capital	General Administrative	Car-Hire Cost	Total
No Build	Common							
	Gateway Yard	$ 1,173	$ 1,764	$ 4,620	$ 532	$ 431	$ 2,878	$ 11,398
	Madison Yard	892	1,301	4,575	479	386	1,997	9,630
	Wiggins Yard	224	476	666	53	78	735	2,232
	Corridor	2,633	3,902	18,644	5,422	1,888	1,837	34,326
	TOFC	--	--	12,300	--	--	--	12,300
	Transfer	--	2,399	26,696	3,041	1,656	--	33,792
	Home Road	18,566	14,695	113,961	6,440	8,598	17,032	179,292
	Total	$ 23,488	$ 24,537	$ 181,462	$ 15,967	$ 13,037	$ 24,479	$ 282,970
Two-Yard Directional	Common							
	Gateway Yard	$ 2,988	$ 2,740	$ 6,908	$ 798	$ 720	$ 4,604	$ 18,758
	Madison Yard	1,504	2,039	4,797	479	475	2,496	11,790
	Corridor	2,284	1,614	7,261	1,775	837	565	14,336
	TOFC	454	2,040	9,563	1,259	536	317	14,169
	Transfer	--	933	10,384	1,183	644	--	13,144
	Home Road	12,350	9,820	76,157	4,258	5,746	11,395	119,726
	Total	$ 19,580	$ 19,186	$ 115,070	$ 9,752	$ 8,958	$ 19,377	$ 191,923
Three-Yard Directional	Common							
	New Yard	$ 1,869	$ 1,863	$ 5,164	$ 639	$ 507	$ 3,515	$ 13,557
	Gateway Yard	2,988	2,699	6,641	798	703	4,649	18,478
	Madison Yard	892	946	2,754	372	262	1,288	6,514
	Corridor	2,282	1,682	7,597	1,879	867	585	14,892
	TOFC	454	2,040	9,563	1,259	536	317	14,169
	Transfer	--	1,050	11,685	1,331	725	--	14,791
	Home Road	10,476	8,364	64,867	3,832	4,894	10,435	102,868
	Total	$ 18,961	$ 18,644	$ 108,271	$ 10,110	$ 8,494	$ 20,789	$ 185,269
Three-Yard Bidirectional	Common							
	New Yard	1,706	2,050	5,730	639	540	3,210	13,875
	Gateway Yard	2,713	2,482	6,641	851	674	3,864	17,225
	Madison Yard	892	964	2,754	372	262	1,288	6,532
	Corridor	2,191	1,550	7,008	1,785	803	551	13,888
	TOFC	454	2,040	9,563	1,259	536	317	14,169
	Transfer	--	827	9,199	1,048	571	--	11,645
	Home Road	9,572	7,711	59,798	3,566	4,512	8,254	93,413
	Total	$ 17,528	$ 17,624	$ 100,693	$ 9,520	$ 7,898	$ 17,484	$ 170,747

Exhibit 4.9: Annual Operating Costs ($000) for the Year 2000

Alternative	Operating Unit Type/Name	Maintenance of Way	Maintenance of Equipment	Transportation	Equipment Capital	General Administrative	Car-Hire Costs	Total
No Build	Common							
	Gateway Yard	$ 1,173	$ 2,195	$ 5,331	$ 692	$ 496	$ 3,336	$ 13,223
	Madison Yard	892	1,329	5,019	532	413	2,026	10,211
	Wiggins Yard	224	548	666	53	82	1,020	2,593
	Other	--	476	666	53	71	455	1,721
	Corridor	3,643	4,921	23,465	7,227	2,402	2,713	44,371
	TOFC	--	--	22,700	--	--	--	22,700
	Transfer	--	2,874	31,977	3,643	1,983	--	40,477
	Home Road	25,215	19,864	154,055	9,154	11,623	24,031	243,942
	Total	$ 31,147	$ 32,207	$ 243,879	$ 21,354	$ 17,070	$ 33,581	$ 379,238
Two-Yard Directional	Common							
	Gateway Yard	$ 2,988	$ 2,796	$ 8,195	$ 905	$ 796	$ 5,819	$ 21,499
	Madison Yard	1,504	2,181	5,907	585	546	3,467	14,190
	Corridor	3,029	2,007	9,007	2,343	1,053	800	18,239
	TOFC	454	2,735	14,308	1,729	727	575	20,528
	Transfer	--	1,129	12,563	1,431	779	--	15,902
	Home Road	16,609	13,132	101,846	5,695	7,684	15,987	160,953
	Total	$ 24,584	$ 23,980	$ 151,826	$ 12,688	$ 11,585	$ 26,648	$ 251,311
Three-Yard Directional	Common							
	New Yard	$ 1,869	$ 2,326	$ 5,708	$ 745	$ 564	$ 4,933	$ 16,145
	Gateway Yard	2,988	2,954	8,417	958	818	6,182	22,317
	Madison Yard	892	1,046	3,198	426	293	1,461	7,316
	Corridor	3,069	2,215	10,019	2,685	1,148	921	20,057
	TOFC	454	2,735	14,308	1,729	727	575	20,528
	Transfer	--	1,336	14,866	1,694	922	--	18,818
	Home Road	14,264	11,312	87,727	5,109	6,619	15,116	140,147
	Total	$ 23,536	$ 23,924	$ 144,243	$ 13,346	$ 11,091	$ 29,188	$ 245,328
Three-Yard Bidirectional	Common							
	New Yard	$ 1,706	$ 2,482	$ 6,441	$ 745	$ 606	$ 4,636	$ 16,616
	Gateway Yard	2,713	2,626	6,641	851	683	5,168	18,682
	Madison Yard	892	1,046	3,198	426	293	1,461	7,316
	Corridor	3,065	2,010	9,067	2,470	1,057	860	18,529
	TOFC	454	2,735	14,308	1,729	727	575	20,528
	Transfer	--	1,027	11,427	1,302	709	--	14,465
	Home Road	13,165	10,506	81,479	4,737	6,147	11,656	127,690
	Total	$ 21,995	$ 22,432	$ 132,561	$ 12,260	$ 10,222	$ 24,356	$ 223,826

Exhibit 4.10: Distribution of Cost Among Common and Home Facilities

	1985		2000	
Alternative	Amount ($000)	Percent	Amount ($000)	Percent
No Build Alternative				
Common Facilities	$ 91,378	32	$112,596	30
Home Road Facilities	191,592	68	266,642	70
	$282,970	100	$379,238	100
Two-Yard Directional Alternative				
Common Facilities	$ 72,197	38	$ 90,358	36
Home Road Facilities	119,726	62	160,953	64
	$191,923	100	$251,311	100
Three-Yard Directional Alternative				
Common Facilities	$ 82,401	44	$105,181	43
Home Road Facilities	102,868	66	140,147	57
	$185,269	100	$245,328	100
Three-Yard Bidirectional Alternative				
Common Facilities	$ 77,334	45	$ 96,136	43
Home Road Facilities	93,413	55	127,690	57
	$170,747	100	$223,826	100

this is that switching performed in home yards under the No Build Alternative would be consolidated and performed in expanded common yards under the Build Alternatives.

This consolidation of switching into fewer facilities with expanded capabilities results in a lower number of handlings per car and provides basic economies of scale, both of which reduce operating costs. Exhibit 4.11 shows the distribution of operating cost savings, relative to the No Build Alternative, between common and home facilities for each of the Build Alternatives in the Years 1985 and 2000.

The average cost of moving a rail car through the study area under each alternative was computed for cars switched, cars not switched (i.e., run-through and unit train cars), and an average of all cars transiting the study area. This was accomplished by simply dividing the annual operating costs associated with each category of cars by the annual number of cars in each category moving within and through the study area. The results of these computations are provided in Exhibit 4.12.

4.2.3 Cost Allocation

The results of operating cost allocation among the roads have been forwarded to the RTAC member(s) of each carrier, for their review. This information is considered sensitive and consequently has not been presented in this report.

4.2.4 Secondary Operating Issues

Centralized Traffic Control (CTC)

As a result of CONSAD's Working Papers 9 and 21, the subsequent discussions with RTAC and a special subcommittee appointed by interested RTAC representatives, SEK revised their previous scheme on CTC into a

Exhibit 4.11: Distribution of Operating Cost Savings Among Common and Home Facilities

Year 1985

	Two-Yard Directional		Three-Yard Directional		Three-Yard Bidirectional	
	Amount ($000)	Percent	Amount ($000)	Percent	Amount ($000)	Percent
Common Facilities	$ 19,182	21	$ 8,981	9	$ 14,065	13
Home Roads	71,866	79	88,724	91	98,449	87
Total	$ 91,048	100	$ 97,705	100	$112,514	100

Year 2000

	Two-Yard Directional		Three-Yard Directional		Three-Yard Bidirectional	
	Amount ($000)	Percent	Amount ($000)	Percent	Amount ($000)	Percent
Common Facilities	$ 22,357	17	$ 7,537	6	$ 16,584	11
Home Roads	105,689	83	126,495	94	138,952	89
Total	$128,046	100	$134,032	100	$155,536	100

Exhibit 4.12: Annual and Per Car Operating Costs by Alternative

	1985	2000
Cars Entering Annually	2,864,700	4,579,200
No Build Alternative		
Operating Expense (000)	$282,972	$379,358
Per Car Expense		
All Cars	$ 98.78	$ 82.14
Cars Switched	$ 129.83	$ 123.92
Cars Not Switched	$ 7.36	$ 6.63
Two-Yard Directional Alternative		
Operating Expense (000)	$191,924	$251,312
Per Car Expense		
All Cars	$ 67.00	$ 54.88
Cars Switched	$ 88.82	$ 83.07
Cars Not Switched	$ 2.74	$ 2.59
Three-Yard Directional Alternative		
Operating Expense (000)	$185,267	$245,326
Per Car Expense		
All Cars	$ 64.67	$ 53.57
Cars Switched	$ 85.65	$ 80.92
Cars Not Switched	$ 2.92	$ 2.83
Three-Yard Bidirectional Alternative		
Operating Expense (000)	$170,458	$223,822
Per Car Expense		
All Cars	$ 59.50	$ 48.88
Cars Switched	$ 78.74	$ 73.78
Cars Not Switched	$ 2.85	$ 2.67

scheme known as alternative III. This scheme involves installation of CTC, controlled by two or three dispatchers, depending on the institutional resolutions in restructuring. CONSAD has reviewed this scheme, and judges that it will provide for efficient operation of the system consistent with the patterns as per the operations analysis. SEK's scheme calls for CTC on all corridors except the A&S, at the specific request of A&S management.

Achievement of the benefits associated with corridor upgrading and signalizing will only result from efficient communication among the line-haul dispatchers and those in charge of the study area trackage. Adequate communications between dispatchers in the study area is equally essential to achieve the benefits of the corridor improvements. At a minimum, study area dispatchers should have access to all radio frequencies used on engines operating on corridors under their supervision.

Paper and Data Flow

CONSAD recommends the establishment of a common management information system interface in the study area. The St. Louis AAR Labor Management Task Force has advised RTAC that it is studying such a system. At the suggestion of RTAC, CONSAD has not pursued this matter further. Absent such a system being operative, CONSAD recommends closed circuit TV cameras at the entrances to the common yards, with adequate recording and viewing equipment in the yard offices of the common yards. If no changes are made in waybill handling, CONSAD also recommends pneumatic tube systems in the common yards to facilitate waybill flow within the yard.

Car Repair

Exhibit 4.13 shows the daily number of bad-order cars anticipated in each of the common yards, under the Two-Yard and Three-Yard Alternatives in the Year 2000. This information has served as input to the planning and design of the car repair facilities at these proposed yards, especially with respect to the required size of these facilities. It is anticipated that there will be a substantially greater number of cars actually repaired than is shown in Exhibit 4.13, but the majority of these additional repairs will be of a minor nature and will be made in the receiving yard by inbound inspection crews equipped to make them.

Road Locomotive Servicing and Repair

RTAC requested that provision be made to service inbound road locomotives at the arrival yard. Exhibit 4.14 shows the number of road and transfer locomotives to be serviced at each yard under this concept in the Year 2000.

Exhibit 4.13: Anticipated Bad Order Cars for Repair Tracks (Year 2000)

Alternative/Yard	Cars Per Day
Two-Yard Directional	
Gateway	101
Madison	64
Total	165
Three-Yard Directional	
Gateway	106
Madison	26
New Yard	81
Total	213
Three-Yard Bidirectional	
Gateway	84
Madison	26
New Yard	80
Total	190

Exhibit 4.14: Common Yard Locomotive Servicing Requirements (Year 2000)

Alternative	Gateway	Madison	New Yard	Total
	Locomotive Units Per Day			
Two-Yard Directional				
Road	84	50	--	134
Switch	25	22	--	47
Total	109	72		181
Three-Yard Directional				
Road	97	--	78	175
Switch	26	19	19	64
Total	123	19	97	239
Three-Yard Bidirectional				
Road	84	--	66	150
Switch	21	19	19	59
Total	105	19	85	209

4.3 Common TOFC Service

4.3.1 Results of Analysis of Operations in the Common Facility

The TOFC operations simulation process was conducted twice, and resulted in revisions to the initial facility design proposed by SEK. The final configuration of the facility was summarized in Exhibit 3.20, and the volume of rail activity at the common TOFC facility was shown in Exhibit 3.21.

Exhibit 4.15 shows the pad track utilization that resulted from the revised simulation. Track occupancy is indicated by a single solid line; the box above the line indicates train activity; and the box below the line indicates crane activity. The absence of a line indicates the track is clear. The notation in the large box for train activity indicates the types of activity (IB = inbound; OB = outbound) and the number of cars. Since the long pad tracks are split in the middle by a road, the track numbers on the left margin of the long tracks are suffixed A or B, with the A end of the track being north of the road, and the B end of the track south of the road. Exhibit 4.15 clearly shows that the utilization of the pad tracks is high. The average utilization of the pad tracks was 64 percent overall, and for the peak period (1,800-2,000 hours) was 94 percent. On review, the RTAC felt that these utilizations were sufficiently high as to warrant the addition of one short and one long pad track to the simulation configuration. The anticipated utilizations of the pad tracks of the final configurations are 54 percent overall and 79 percent for the peak period.

Exhibit 4:15: Pad Track Utilization - Revised Simulation

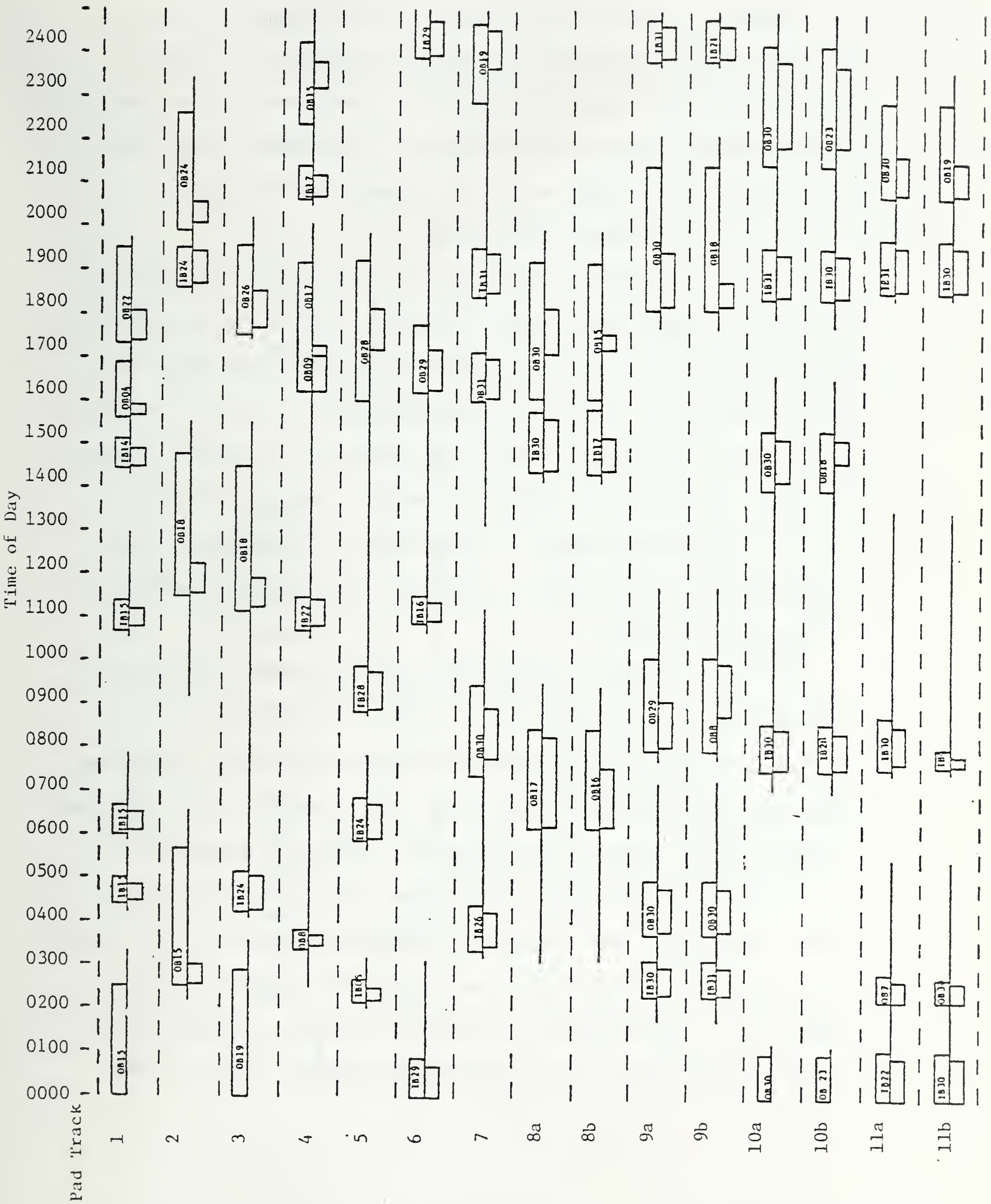


Exhibit 4.16 shows the utilization of the storage and receiving/departure tracks for the same time period as Exhibit 4.15 showed the activity of the pad tracks. The solid line indicates that the track is being utilized. The overall utilization of the storage tracks was 92 percent, and of the receiving/departure tracks was 18 percent.

4.3.2 Mobile Resource Utilization

In order to expedite loading/unloading, two cranes were used as a pair on each track or half-track. Exhibit 4.17 shows the utilization of the crane pairs during the same 24 hour period as that shown for track utilization. The method of preparing this graph was to identify each segment of crane pair activity and successively add lines, so that the total crane pair requirements, in terms of number of crane pairs, is equal to the maximum number of lines used. As can be seen, the maximum number of crane pairs in operation at one time is eight, hence, 16 cranes were needed.

The use of cranes as single units instead of pairs was examined, as shown in Exhibits 4.18 and 4.19. Exhibit 4.18 is similar to Exhibit 4.15, except that crane activity for single cranes is shown as a dashed line extending through the box "below the line" which indicates crane activity. Standard time values for loading and unloading were used to determine the length of the dashed line. As can be readily seen, single cranes meet all of the schedule requirements, given a two-hour cutoff time. Exhibit 4.19 was prepared in the same manner as Exhibit 4.17, and shows that 12 cranes will suffice, if single cranes are used, as opposed to the 16 cranes utilized when crane pairs were

Exhibit 4.16: Support Yard Utilization - Revised Simulation

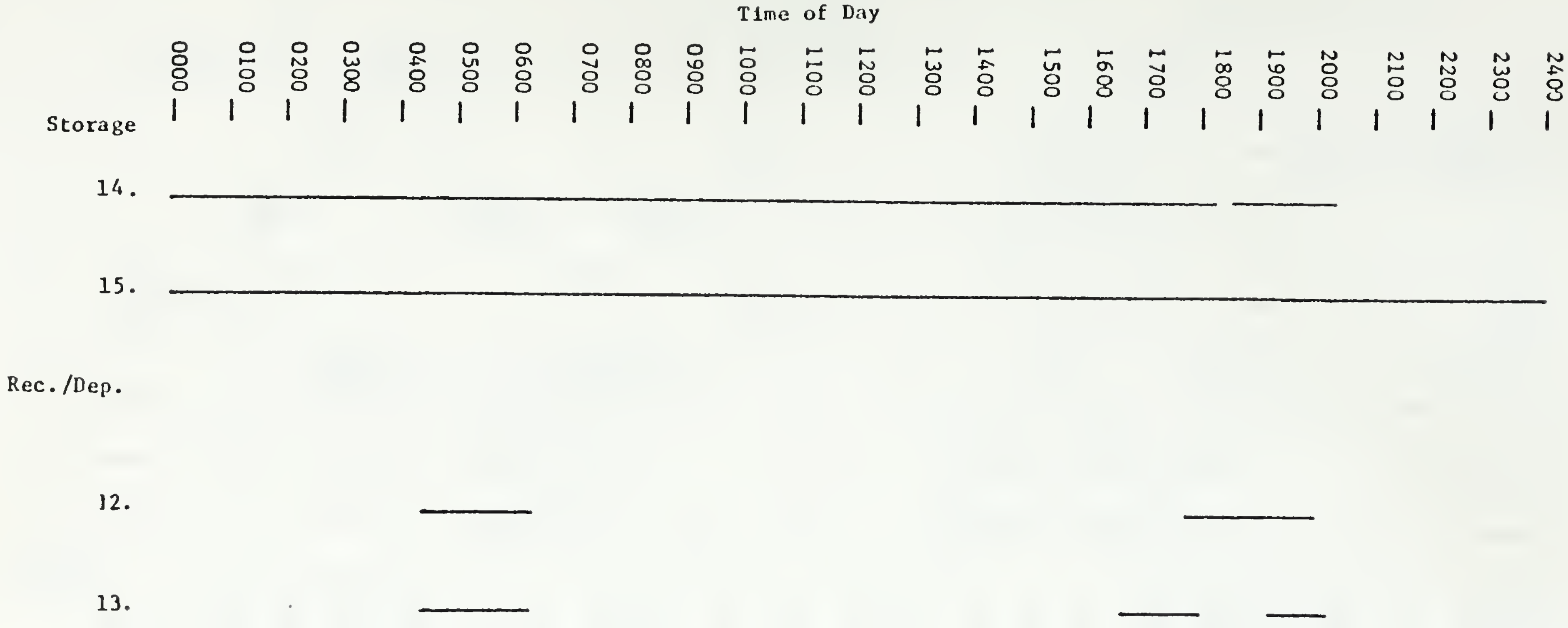


Exhibit 4.17: Crane Pairs Utilization - Revised Simulation

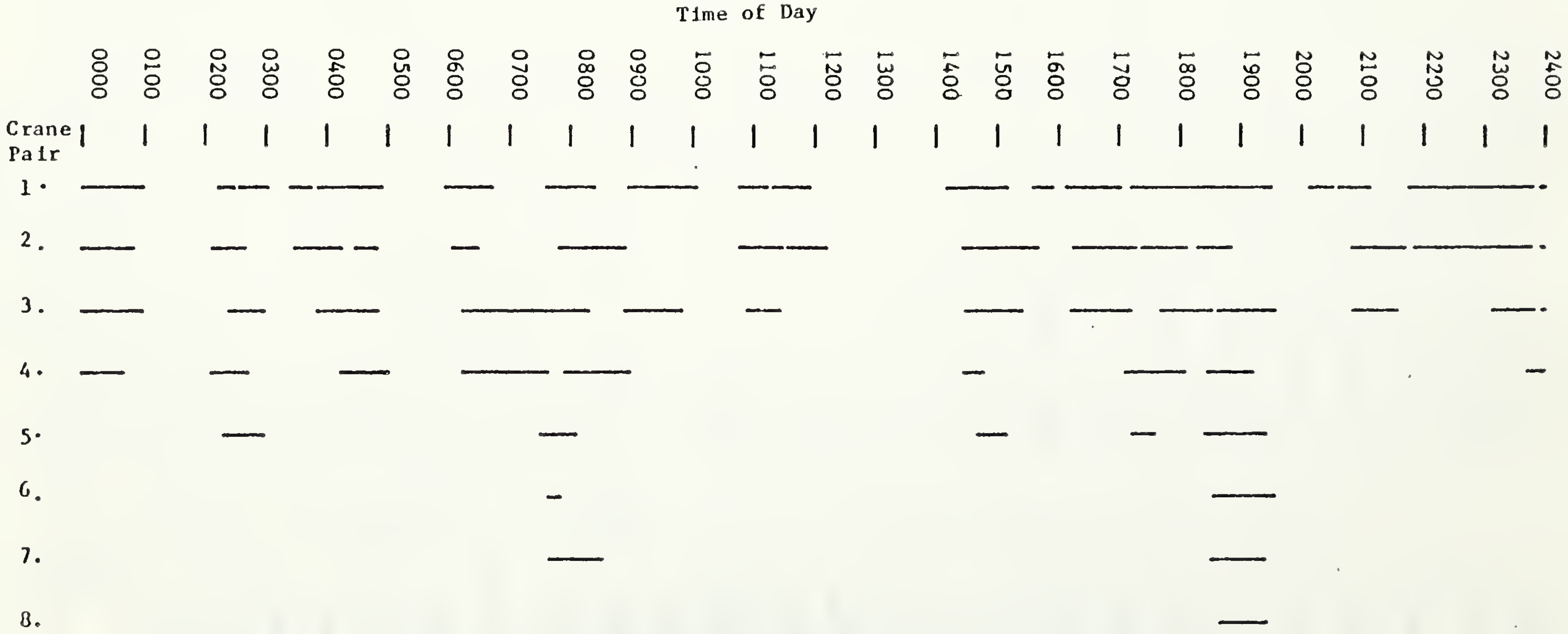


Exhibit 4.18: Pad Track Utilization Revised Using Single Cranes Compared to Crane Pairs

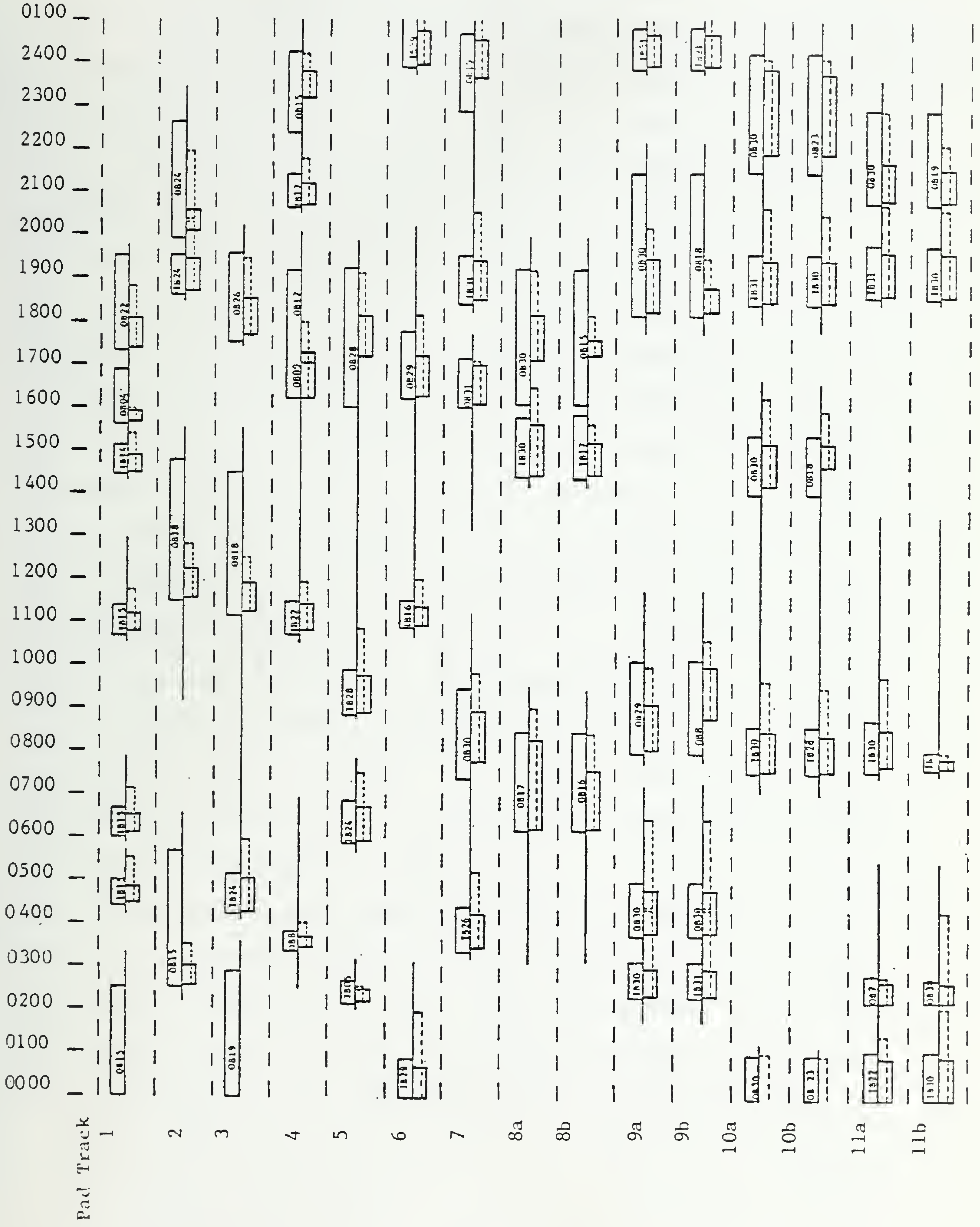
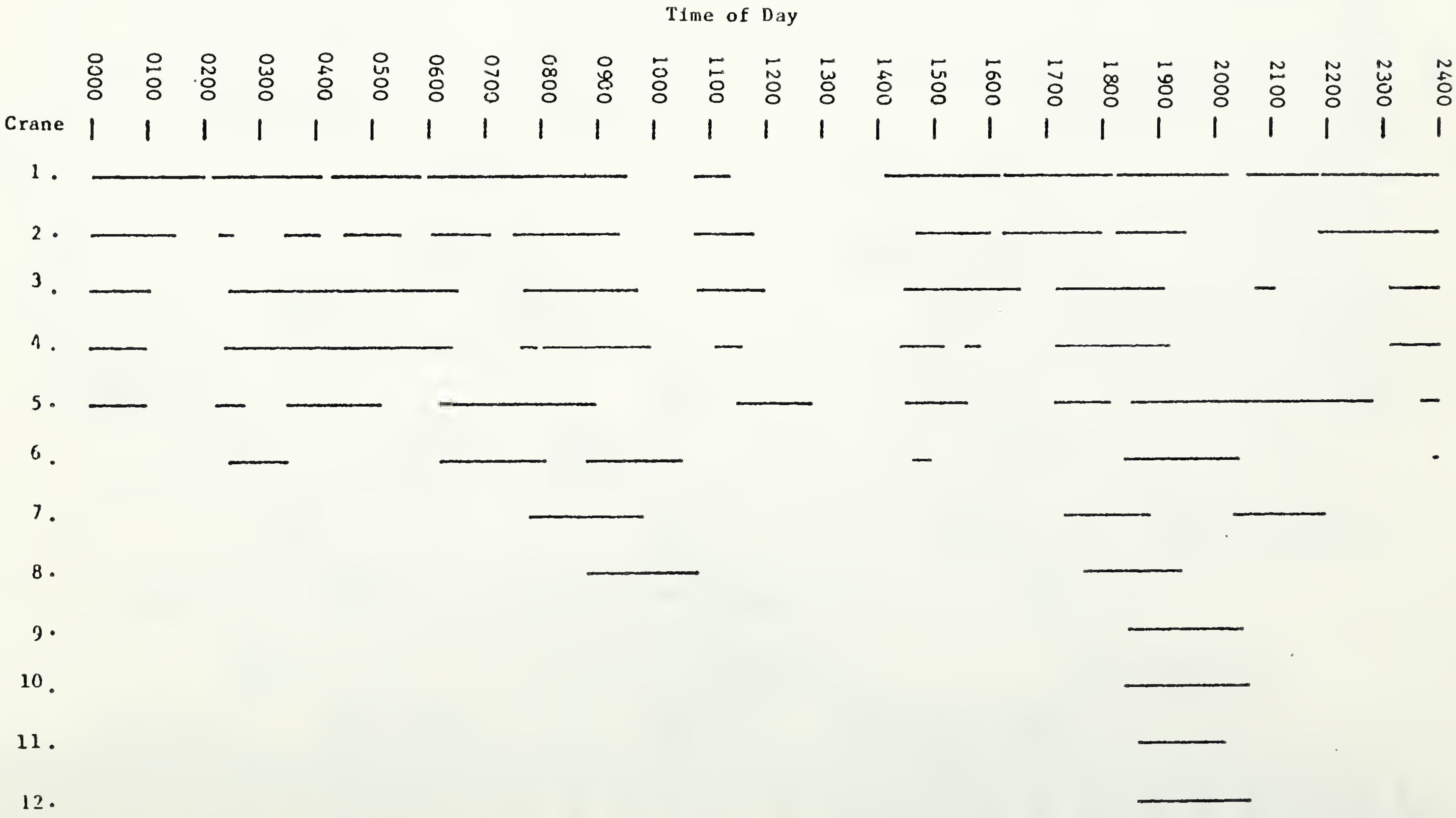


Exhibit 4.19: Single Crane Unit Utilization - Revised Simulation



used. Thus, it appears that the use of single crane units, rather than crane pairs, would be more efficient and less costly, in terms of the investment in facility equipment.

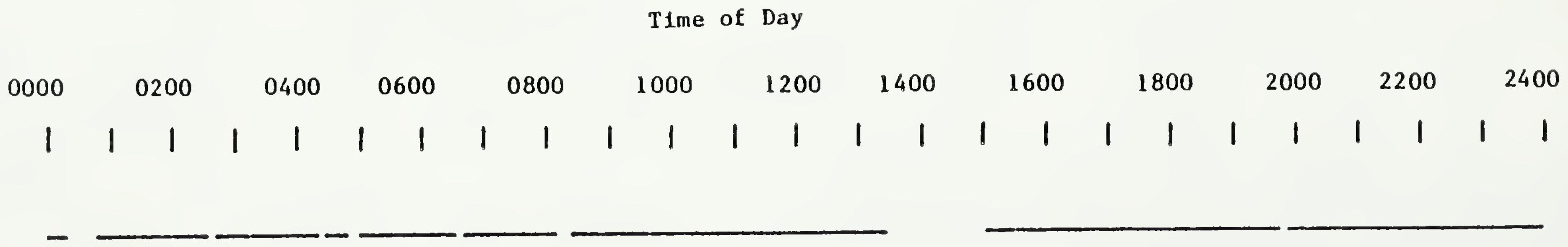
The switch engine supporting the facility was used, overall, 87 percent of the time, as shown in Exhibit 4.20, with the peak periods of utilization occurring during the first and second shifts.

The near constant use of the switch crew, assumed to work at the north, or A, end of the facility, suggests that two switch crews would probably be needed, at least on the first and second tricks. The work done concerning transfer crews into and out of the new TOFC facility suggests that some of these crews could, perhaps, be used to supplement the TOFC facility operations if institutional arrangements permit.

Exhibit 4.21 is a graph showing the number of flatcars on hand. This exhibit shows that the minimum number of flatcars on hand is reached at 2342 hours and the maximum number of flatcars on hand is 514, based on the initial assumption of 277 on hand at the beginning of the simulation (0001 hours). This compares quite favorably with the 291 flatcars the eight individual carriers had on hand at midnight of the study day, March 30, 1979.

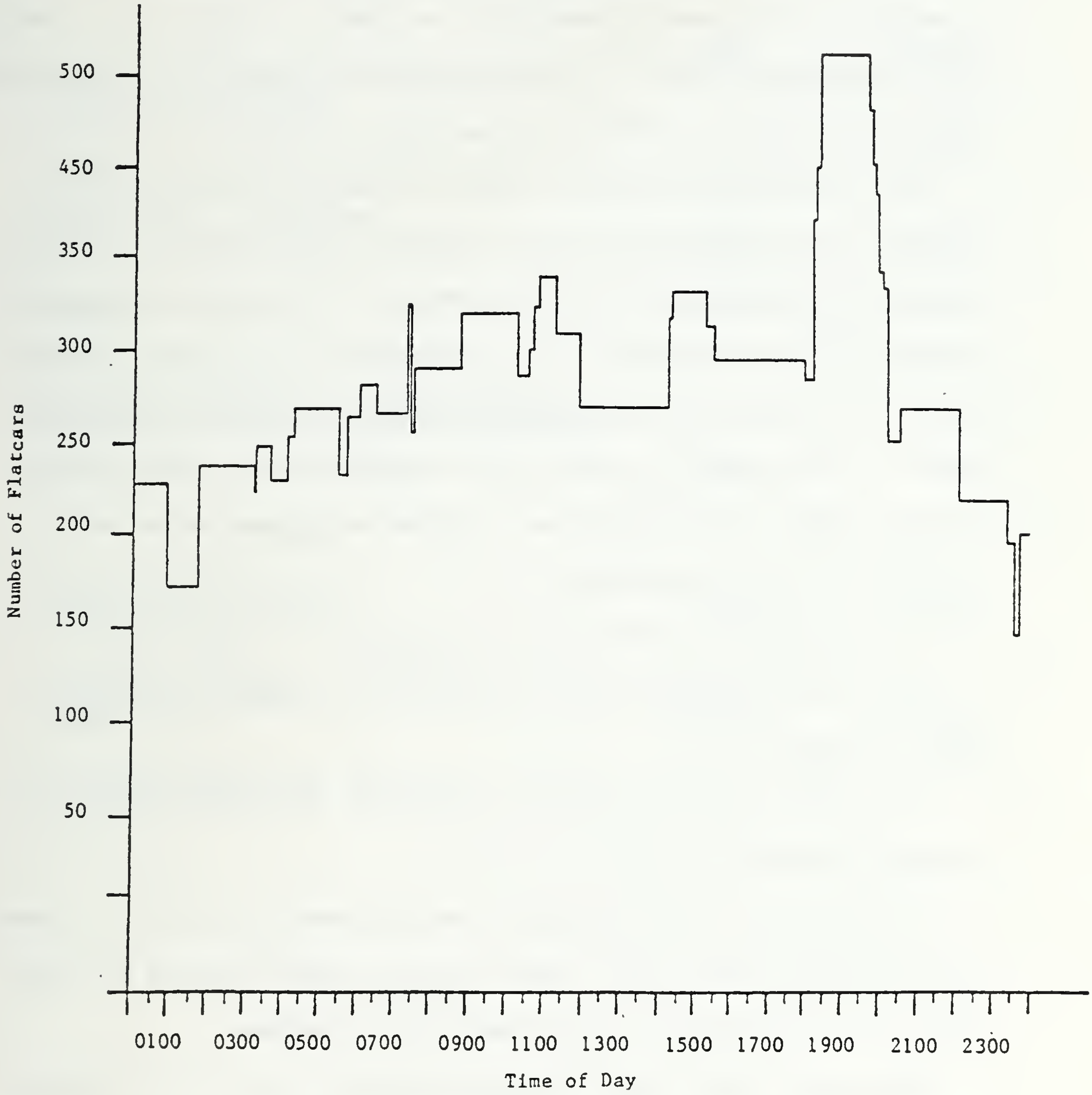
The proposed facility was capable of handling the load of the eight carriers relatively well at the year 2000 traffic levels. The simulation showed that the track occupancy is high and, based on the simulation results, the pad tracks were rearranged to provide one more long track and one more short track, as was previously mentioned.

Exhibit 4.20: Switch Engine Utilization - Revised Simulation



NOTE: Necessary switch engine moves, shown above, result in an overall engine utilization of 87 percent.

Exhibit 4.21: Level of Flatcars on Hand - Revised Simulation



The establishment of the joint common facility will change the distance trailers must be moved on the St. Louis area highway system. In general, this change is beneficial, as shown in Exhibit 4.22, since total truck-miles related to industry pickup and delivery would decrease significantly under the Build Alternatives.

The truck-miles statistics shown were derived by computing the distance each truck travels between individual railroads ramp locations in accomplishing over-the-road interchange, or the distance between the customer and the individual road's ramp location in the case of local pickup and delivery service. These distances were multiplied by the number of trips made over each route to determine truck miles. The estimated value of this reduction, in terms of drayage costs, is included in the cost estimates.

4.3.3 Results of TOFC Operations Costing

The rail operations costs of operating the common facility are shown in Exhibit 4.23.

The trailer handling operations costs for the common TOFC facility are shown in Exhibit 4.24.

Transfer costs associated with hauling loaded TOFC blocks to roads not choosing to operate road trains from the common facility were computed in the same manner as for other freight business.

The sum of these costs is shown in Exhibit 4.25, with a subtotal for the expenses incurred within the facility.

Exhibit 4.22: Daily Highway Truck Miles Associated with TOFC Operations

	1985		2000	
No Build Alternative				
Truck Miles in Interchange	7,222		13,251	
Truck Miles in Industry Pick-up and Delivery	10,649		18,737	
Total	17,871		31,988	
Two-Yard and Three-Yard Directional and Three-Yard Bidirectional Alternatives				
Truck Miles in Interchange	3,839		6,140	
Percent Change Vs. No Build		-47		-54
Truck Miles in Industry Pick-up and Delivery	10,923		19,220	
Percent Change Vs. No Build		2		2
Total	14,762		25,360	
Percent Change Vs. No Build		-17		-11

Exhibit 4.23: Rail Operations Costs
Common TOFC Facility

Account/Activity	Annual Cost 1985	Annual Cost 2000
Maintenance of Way	$ 454,055	$ 454,055
Maintenance of Equipment	1,163,687	1,358,537
Transportation	666,943	889,255
Locomotive Capital Cost	53,223	53,223
Car Hire Cost	317,048	575,316
General and Administrative	148,505	175,620
Total	$2,803,461	$3,506,006

Exhibit 4.24: Trailer Handling Operations Costs
Common TOFC Facility

Account/Activity	Annual Cost 1985	 2000
Clerical Activity	$1,148,200	$ 1,859,000
Drayage	1,823,800	3,269,700
Pad and Lot Equipment Operators	3,312,100	5,159,900
Pad and Lot Equipment Capital Cost	939,600	1,409,500
Pad and Lot Equipment Maintenance	689,600	1,168,500
Pad and Lot Fuel Cost	511,900	797,200
General and Administrative Cost	257,300	406,200
Total	$8,682,500	$14,070,000

Exhibit 4.25: Summary of Annual TOFC Operating Costs ($000)

Account/Activity	Maintenance of Way		Maintenance of Equipment		Transportation		Equipment Capital Cost		General and Administrative		Car Hire Costs		Total	
	1985	2000	1985	2000	1985	2000	1985	2000	1985	2000	1985	2000	1985	2000
Rail Operations	$ 454	$ 454	$ 1,164	$ 1,359	$ 667	$ 889	$ 53	$ 53	$ 149	$ 176	$ 317	$ 575	$ 2,804	$ 3,506
Trailer Handling			689	1,168	6,796	11,086	940	1,409	257	406			8,682	14,069
Subtotal	$ 454	$ 454	$ 1,853	$ 2,527	$ 7,463	$11,975	$ 993	$ 1,462	$ 406	$ 582	$ 317	$ 575	$11,486	$14,575
Transfer Cost			187	208	2,100	2,333	266	266	130	145			2,683	2,952
Total	$ 454	$ 454	$ 2,040	$ 2,735	$ 9,563	$14,308	$ 1,259	$ 1,728	$ 586	$ 727	$ 317	$ 575	$14,169	$20,527

A comparison between the cost of trailer handling activity in the common facility and the sum of the trailer handling costs estimated for the individual participating carriers in their existing facilities was made for both 1985 and 2000 traffic levels. The estimates of individual carriers' facilities trailer handling costs were made from projections of the force (labor and equipment) required for each carrier to handle its portion of the common facility's traffic in its existing facility(ies). The force projections were made based on current force requirements in the individual carriers' facilities and the growth rates for TOFC traffic, assuming the roads maintained their current levels of productivity. It was not possible to make any reasonably accurate estimate of the costs associated with rail activity (i.e., car switching, MOW, locomotives, etc.) in the individual carriers' intermodal facilities, but these costs are generally small in comparison to trailer handling costs. However, it is reasonable to assume that some economies of scale for this rail activity exist, and that these costs would be less for one large facility than for several smaller facilities.

Exhibit 4.26 presents the results of the above cost comparisons. From this exhibit it can be seen that estimated trailer handling operations cost savings, in constant 1979 dollars, related to the common facility, would be $4,400,000 per year at 1985 levels of traffic and $10,500,000 per year at 2000 traffic levels.

Exhibit 4.26: Summary of Common TOFC Benefits

	Individual Operations		Common Facility	
	1985	2000	1985	2000
Trailer Volume	$ 3,285	$ 6,064	$ 3,285	$ 6,064
Annual Clerical Costs	1,600,000	2,800,000	1,500,000	2,200,000
Interchange Cost	4,900,000	9,600,000	1,800,000	3,300,000
Lifts	5,800,000	10,300,000	4,600,000	6,700,000
Total	$12,300,000	$22,700,000	$ 7,900,000	$12,200,000

Notes:

1) Roads that would participate have 45 clerical employees, handling 2,629 trailers at 1979 levels of business. By 2000, estimates show 104 clerical employees, for 6,064 trailers. Proposed common facility operated with 80 clerical employees.

2) The average cost of a lift for participating roads is $14.32 (range $5.43 to $20,67). The average cost of a lift in the common facility was estimated to be $9.23 (includes 12 cranes, 60 spotting tractors, operators, fuel, maintenance) with 1,494 lifts in 1985, 2,701 lifts in 2000.

3) Rubber interchange, for the participating roads, by year 2000 will cost $9,600,000; these roads will save $6,300,000 by interchanging within the common facility.

5.0 COST-EFFECTIVENESS

5.1 Methods and Parameters

The assessment of the several alternatives has focused on estimating three measures of effectiveness, under projected levels of traffic. These measures are the following:

- Transit time through the study area;
- Operations cost; and
- Reliability.

In attempting to relate these three measures of effectiveness to capital cost, only one of them (Operations Cost) is in comparable terms of dollars. The other two measures are in units of time and a series of indices which attempt to measure reliability.

In traditional benefit-cost analysis, all evaluation factors are reduced to common units (usually dollars) so that benefit-cost ratios can be calculated. The development of appropriate dollar values to apply to time and reliability is judged by CONSAD to involve either extensive analysis or use of rather crude estimates. Moreover, this would mask the significance of these two factors as separate and important measures of effectiveness. Thus, time and reliability are kept as separate measures, with the result that the evaluation is appropriately termed "Cost-Effectiveness Analysis." The key to the evaluation has been the detailed tracking through the system (yard and corridor components) of the movements of the 1,500-odd origin-destination pairs comprised of units of traffic making particular interchanges within the study area. Both the operations analysis and the operations costing have retained detail in time and cost analysis, so as to be able to provide time and cost estimates for each O-D pair handled. Various combinations of these provide summary measures of time and cost by train; by carrier; by subsystem (yard or corridor); and for the system as a whole.

Certain specific aspects of the measurement system are described in the following sections.

5.1.1 Cost

There are two basic types of cost at work in the system under analysis, capital cost and operating cost.

Capital cost is the set of expenditures required for the physical improvements to the common yards and the rail corridors of the St. Louis Terminal system and the required equipment acquisitions. These physical improvements are described in various CONSAD working papers and in documentation developed by SEK. SEK has been responsible for estimation of these capital costs.

The restructuring study has focused on traffic levels and physical facilities present in the base year (1979) and for the planning horizon year (2000). Additionally, the analysis was applied to a 1985 level of traffic with physical facilities of the year 2000.

For the purposes of operations analysis, the planning years were treated as discrete points in time, and the physical facilities are assumed to exist at that point in time without regard to the time sequencing of construction.

In performing the cost-effectiveness analysis, the question of timing of capital expenditures (or staged construction) has been considered in determining net present value and internal rates of return for the stream of capital and operating costs over the economic lives of the investments being made, given the assumed time sequence of capital expenditures.

In relating one-time (capital) expenditures to recurrent (annual) expenditures, such as operating cost, two approaches were taken. The first was to calculate the net present value. This requires the selection of a rate of interest. CONSAD has used a rate of interest of ten percent.* That rate might be subject to a slight adjustment upward to represent recent market interest rates. It does represent a rate somewhat higher than rates applied in recent years in other public planning efforts, but is considerably lower than railroad internal rate of return levels as sought by rail carriers on solely private investments.

The selection of economic life is often made specific to the various components of capital cost. For example, a fifty year life might be applied to land purchased for right-of-way; forty years for grading expenditures; thirty years for drainage structures, new ties, and rail; and possibly twenty years for signals and communications facilities.

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*The ten percent interest rate chosen by CONSAD is the interest rate prescribed by the U.S. Department of Transportation, Office of the Secretary, in DOT Order 5000.1, Discount Rates to be Used in Evaluating Time-Distributed Costs and Benefits, June 30, 1972, which is still in effect. (This order implements the regulations set forth in Office of Management and Budget Circular No. A-94 - Revised). This ten percent interest rate, used to discount future cash flows, is meant to represent the average opportunity cost of investing funds in capital projects and does not include any provision for a rate of inflation. If inflation rates are considered, this ten percent rate would be equivalent to a nominal interest rate of approximately 18 to 20 percent per year. However, since CONSAD has analyzed costs and benefits related to restructuring alternatives in constant 1979 dollars, the effect of inflation on the future cash flows is not a factor in the analysis of cost-effectiveness.

However, the values used for maintenance of way and structures are recognized as including a substantial amount of cost for replacement of rail, ties, and other such items, and in effect already includes "recapitalization" of the facilities. Therefore, a fifty year economic life was used for all capital expenditures. The fifty years were assumed to occur after completion of construction, which is estimated as taking eight years. Thus, the economic analysis involves a stream of costs and benefits over a 58 year period.

The other component of cost is operations cost. The analytic methodology and costing system developed by CONSAD has permitted estimation of operations costs at a very detailed level. All costs except MOW were developed at the level of individual trains for corridor costing.

5.1.2 Effectiveness

The objective of the cost-effectiveness analysis is to measure the effectiveness of the capital expenditures in terms of the four measures of performance of the study area system: Throughput Volume (TV); Transit Time Through the Study Area (TT); Operations Cost (OC); and Reliability (RE).

Throughput volume for the study area system as a whole has been projected from the 1979 base, to the years 1985 and 2000, without regard to alternative (Two-Yard, Three-Yard, No Build). Thus, these totals are fixed and do not enter the comparison of alternatives. There are, however, among the alternatives, different traffic assignments to corridors and common yards. Therefore, the traffic volumes for these system components have varied from one alternative to the next.

Transit Time Through the Study Area (TT), is a key factor estimated in the operations analysis. It includes a linkage of time segments which account for the time from when every car to be switched in the terminal enters the study area or is received locally; is moved to a common (or other) classification yard; is handled at the yard(s); and is dispatched out of the study area or is received locally; is moved to a common (or other) classification yard; is handled at the yard(s); and is dispatched out of the study area or delivered locally. TT was estimated, under each alternative, for a sample of O-D pairs which were switched in the study area, and was expanded to obtain total TT in car-hours, and, dividing by the number of cars to be switched, the average TT, as was previously described in Section 3, Methods of Analysis. The results of CONSAD's TT analysis have been presented in Section 4, Results.

The third measure of effectiveness, Operating Cost (OC), has been described in Sections 3 and 4 of this report. CONSAD has provided, in Section 4, summary results for OC.

The fourth independent measure of effectiveness is Reliability (RE). The methods employed in the analysis of Reliability were discussed in Section 3 and the summary results of this analysis have been presented in Section 4 of this report.

The only measure of system performance which can be directly related to capital expenditures is operations cost. The relationships of those two types of costs which have resulted from the operations analysis are given in Section 5.2. The comparison of alternatives in all of the measures of performance is given in Section 5.3.

5.2 Financial Analysis

Analysis of investments proposed for the study involves the evaluation of a number of factors, all of which have been discussed previously in this report. Among the factors, two are of particular importance because they are in comparable terms of dollars. These two directly comparable factors are capital cost and operating cost. This section describes the quantitative comparison of capital investments with the savings in operating cost over the economic lives of the proposed facilities. All costs are presented in constant 1979 dollars.

5.2.1 Capital Costs

CONSAD was provided estimates of capital costs to be expended to implement each of the alternatives by SEK. Those costs by construction year are given in Exhibit 5.1. It can be seen that the construction period is assumed to last eight years. Some of the corridor improvements and the consolidated TOFC facility are to be completed before the end of the eight-year period.

The capital investments are assumed to have a useful economic life of fifty years beyond construction. After that time period, some components will have a salvage value. Exhibit 5.2 shows the assumed salvage values used. These values vary with the nature of the improvements and are consistent with accepted engineering practice, and with assumptions utilized in the estimation of operations (including maintenance) costs by CONSAD.

It should be noted that the capital costs provided are intended to represent only those costs associated with the Build Alternatives.

Exhibit 5.1 Railroad Related Capital Cost by Construction Year (Constant 1979 Dollars)

Construction Year	Capital Cost by Alternative* Two-Yard Directional	 Three-Yard Directional	 Three-Yard Bidirectional
1	$ 42,330,000	$ 44,420,000	$ 43,280,000
2	113,170,000	117,320,000	116,560,000
3	146,730,000	159,310,000	155,640,000
4	81,490,000	93,000,000	89,300,000
5	49,330,000	60,270,000	56,560,000
6	33,550,000	44,360,000	40,980,000
7	33,450,000	44,190,000	40,580,000
8	31,110,000	41,780,000	38,180,000
TOTAL	$531,160,000	$604,650,000	$581,080,000

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*These capital costs exclude costs, such as those for the clearing of riverfront land, which were not considered by SEK to be specifically related to the restructuring of railroad operations within the study area.

Exhibit 5.2: Assumed Salvage Values by Components
(Constant 1979 Dollars)

Component	Percent of Investment Salvageable After 50 Years	Salvage Value by Alternative		
		Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
Trackwork	10%	$ 7,734,000	$ 7,713,000	$ 7,450,000
Signaling	10%	3,870,000	3,939,000	3,939,000
Grading	50%	11,403,000	13,512,000	13,012,000
Roadbed Preparation	25%	287,000	364,000	322,000
Drainage	50%	3,750,000	5,000,000	5,000,000
Ditch Relocation	50%	1,250,000	4,450,000	4,450,000
Structures	10%	4,773,000	6,258,000	6,258,000
TOTAL		$33,067,000	$41,236,000	$40,431,000

The capital cost of the No Build Alternative is neglected, which is an implicit assumption of zero capital cost for that alternative.

Such an assumption is not precisely correct. As has been discussed above, the No Build Alternative is not the same as a "no cost" alternative. In order to handle the traffic volumes projected for the year 2000, investments will have to be made either within or outside of the study area. The neglect of those investments will tend to overstate the capital costs due to each of the Build Alternatives.

5.2.2 Operations Cost Savings

The estimated operating costs for each of the alternatives analyzed is given in Exhibits 4.8 and 4.9 for the years 1985 and 2000, respectively. The differences between those costs for each of the Build Alternatives as compared with the No Build Alternative provides the estimate of operating cost savings. The annual operating costs and savings for the years 1985 and 2000 are shown in Exhibit 5.3.

In order to represent the annual operating cost savings over the fifty-eight year economic period of interest, certain assumptions were necessary. First, it was assumed none of the savings in yard operating costs would be realized until the yard construction was completed after the full eight year construction period. Second, owing to the fact that the consolidated TOFC facility and the corridor improvements would be completed after four years, some of the cost savings due to those improvements could be realized in year five and thereafter. Third, since the facilities were designed at year 2000 traffic levels, all cost savings from 2001 through the fifty-eighth year (2039) were held constant.

Exhibit 5.3: Projected Annual Operating Costs and Savings Versus No Build Alternative (Constant 1979 Dollars)

Alternative	1985 (000's of $) Costs	1985 (000's of $) Savings *Vs.* No Build	2000 (000's of $) Costs	2000 (000's of $) Savings *Vs.* No Build
No Build	282,972	--	379,358	--
Two-Yard Directional	191,924	91,048	251,312	128,046
Three-Yard Directional	185,267	97,705	245,326	134,032
Three-Yard Bidirectional	170,458	112,514	223,822	155,536

Even though no cost savings could be realized in the early years of project implementation, the estimates of savings in 1985 were used, with year 2000 estimates, to provide for interpolation of the intermediate years. Cost savings for the 1986 through 2000 period for TOFC and corridors, and the 1990 through 2000 period for yards were interpolated using a compound growth factor.

The resulting operating cost savings by alternative and project year is shown in Exhibit 5.4. Again, the savings are projected as the difference in operating costs for each alternative, relative to the No Build Alternative.

5.2.3 Return on Investment

The projected stream of capital costs and benefits (savings in operating costs) has been analyzed in a discounted cash flow context, and the results are given for each of the Build Alternatives in Exhibit 5.5. It shows that all three of the Build Alternatives are worthwhile projects which will result in benefits which exceed costs over the project life. The Three-Yard Bidirectional Alternative performs best with a net present value (at 10 percent interest) of over 314 million dollars, and a 14.9 percent internal rate of return (IRR). The Two-Yard Directional Alternative is next best, with a 14.0 percent IRR, with the Three-Yard Directional Alternative least attractive of the three. Its IRR is 13.4 percent.

The results shown in Exhibit 5.5 are all based on the unit cost values as described in Section 3 and all the conditions described earlier in this report. There are two factors which can have a significant effect on the results of the investment analysis and should be taken into account. These are car-hire costs and labor protection.

Exhibit 5.4: Operations Cost Savings by Alternative and Year (Constant 1979 Dollars)

Year	Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
1982	0	0	0
1983	0	0	0
1984	0	0	0
1985	0	0	0
1986	$ 21,795,242	$ 21,795,242	$ 21,795,242
1987	27,272,399	27,272,399	27,272,399
1988	27,946,083	27,946,083	27,946,083
1989	28,623,000	28,623,000	28,623,000
1990	103,380,660	109,814,000	126,854,660
1991	105,847,190	112,235,800	129,722,790
1992	108,313,720	114,657,600	132,590,920
1993	110,780,250	117,079,400	135,459,050
1994	113,246,780	119,501,200	138,327,180
1995	115,713,310	121,923,000	141,195,310
1996	118,179,840	124,344,800	144,063,440
1997	120,646,370	126,766,600	146,931,570
1998	123,112,900	129,188,400	149,799,700
1999	125,579,430	131,610,200	152,667,830
2000	128,046,000	134,032,000	155,536,000
2001-2039	$128,046,000	$134,032,000	$155,536,000

Exhibit 5.5: Results of Financial Analysis, by Alternative

	Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
Construction Period, years	8	8	8
Project Life, years	50	50	50
Analysis Period	1982-2039	1982-2039	1982-2039
Total Capital Costs	$531,160,000	$604,650,000	$581,080,000
Salvage Value After 58 Years	$ 33,067,000	$ 41,232,000	$ 40,431,000
Present Value of Costs @ 10%	$379,060,000	$425,080,000	$410,380,000
Present Value of Benefits @ 10%	$604,549,000	$633,067,000	$724,492,000
Net Present Value @ 10%	$225,489,000	$207,987,000	$314,112,000
Benefit/Cost Ratio @ 10%	1.59	1.49	1.76
Payback Period, years	18.0	19.3	16.6
Internal Rate of Return	14.0	13.4	14.9

Note: All dollar figures represent constant 1979 dollars.

The value used in the cost analysis for car-hire was derived from per diem charges of the cars actually passing through St. Louis on March 30, 1979. The value used was 30.7 cents per car-hour and represents per diem charges for a variety of car types and ages. The promise of the MARGE project and the findings described in this report indicate the capital investments made will decrease the time to traverse the study area. At issue, however, is the value of the time saved. While per diem is a useful number since it represents the charges which each railroad assesses for car usage on another road, it does not adequately reflect the resource cost or value of savings in car time. In fact, to the extent that time saved in St. Louis will allow railroads greater use of their car fleets and postpone purchase of new cars, the appropriate value of car time saved is the value of replacement cars. That value would reflect the purchase price of new cars and current interest rates.

A recent article in Modern Railroads has placed a value on the car fleet which translates to 70 cents per car-hour. In order to incorporate replacement cost into the investment analysis, that value 70 cents per car-hour, was used to adjust the benefits due to restructuring. The effect of using that value for car-hire is to change the economic indices as shown in Exhibit 5.6.

The effect of incorporating labor protection into the evaluation is to increase costs for the period of labor protection payments, and thus to reduce the project returns. Costs of labor protection payments were obtained from SEK and are shown in Exhibit 5.7 for the six-year period starting with the ninth year.

Exhibit 5.6: Effects of Replacement Costs for Car-Hire and Labor Protection

	Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
Use of Replacement Costs for Car-Hire			
Increase in Net Present Value	+$ 42,931,000	+$ 28,834,000	+$ 55,097,000
Revised Benefit-Cost Ratio	1.71	1.56	1.90
Revised Internal Rate of Return	14.6	13.8	15.7
Inclusion of Labor Protection Costs			
Decrease in Net Present Value	-$ 10,442,000	-$ 9,426,000	-$ 19,464,000
Revised Benefit-Cost Ratio	1.57	1.47	1.72
Revised Internal Rate of Return	13.8	13.2	14.6
Replacement Costs and Labor Protection			
Revised Net Present Value	$257,978,000	$227,395,000	$349,745,000
Revised Benefit-Cost Ratio	1.68	1.53	1.85
Revised Internal Rate of Return	14.4	13.6	15.3

Note: All dollar figures represent constant 1979 dollars.

Exhibit 5.7: Estimates of Labor Protection Costs
(Constant 1979 Dollars)

Project Year	Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
9	$12,905,000	$12,200,000	$20,186,000
10	7,078,000	6,681,000	12,443,000
11	3,397,000	3,349,000	8,326,000
12	2,037,000	1,115,000	5,540,000
13	1,043,000	264,000	3,329,000
14	373,000	134,000	1,705,000
TOTAL	$26,833,000	$23,743,000	$51,529,000

The effect of including labor protection costs into the financial analysis is also shown in Exhibit 5.6 along with the effect of using replacement cost for car-hire. The bottom of that exhibit shows measures of financial performance with adjustments made for both factors.

5.2.4 Incremental Investment Analysis

Throughout the financial analyses presented in the preceeding sections, the three Build Alternatives have been analyzed and/or compared with respect to the No Build Alternative. That is, the financial results of making capital expenditures to realize benefits in the form of operating cost savings, under each Build Alternative, have been measured in terms of incremental changes versus the No Build Alternative.

Another interesting manner in which the capital and operating costs associated with each of the Build Alternatives could be analyzed was the measurement of incremental changes in capital expenditures and operating cost savings of these alternatives relative to one another. This was done by ranking the three Build Alternatives in order of increasing capital costs of implementation and analyzing the financial effects of making the incremental increases in capital investment to go between alternatives of lower capital costs to those of higher capital costs. In following this procedure, it was possible to analyze the incremental changes in capital costs and operating cost savings between the following Build Alternative combinations:

- From Two-Yard Directional (capital cost: $531 million) to Three-Yard Bidirectional (capital cost: $581 million);
- From Two-Yard Directional (capital cost: $531 million) to Three-Yard Directional (capital cost: $605 million); and

- From Three-Yard Bidirectional (capital cost: $581 million) to Three-Yard Directional (capital cost: $605 million).

The results of this incremental investment analysis are presented in Exhibit 5.8. From this exhibit it can be seen that the incremental investment of $31,320,000 made in going from the Two-Yard Directional to the Three-Yard Bidirectional Alternative would be worthwhile; since it makes a significant contribution to the net present value of restructuring, has a large benefit/cost ratio and a relatively high internal rate of return, which at 21.8 percent is significantly greater than the ten percent opportunity cost of capital assumed in these analyses. In fact, the incremental investment in going from the Two-Yard Directional to the Three-Yard Bidirectional Alternative is the only one of the three possible increments analyzed which makes a positive contribution to net present value and has a benefit/cost ratio of more than one. Thus, based on this analysis, the incremental increase in capital investment required to go from the Two-Yard Directional or Three-Yard Bidirectional Alternatives to the Three-Yard Directional Alternative would not be warranted. This analysis also supports the results of the preceeding financial analyses, indicating that the Three-Yard Bidirectional Alternative would have the best financial performance of any of the Build Alternatives.

5.3 Results and Conclusions

5.3.1 Summary of Results

As noted above, the dollar valued savings in operating cost is just one of the measures for evaluation. Other performance measures for each alternative have been presented in Section 4. Exhibit 5.9

Exhibit5.8: Incremental Investment Analysis Summary

	Increments Between Build Alternatives		
	Two-Yard Directional/ Three-Yard Bidirectional	Two-Yard Directional/ Three-Yard Directional	Three-Yard Bidirectional/ Three-Yard Directional
At 10% Interest Rate:			
Present Value of Incremental Capital Costs	+$ 31,320,000	+$ 46,020,000	+$ 14,700,000
Present Value of Incremental Operating Cost Savings	+$123,087,000	+$ 15,437,000	-$107,650,000
Net Present Value of Incremental Investment	+$ 91,767,000	-$ 30,583,000	-$122,350,000
Benefit/Cost Ratio of Incremental Investment	3.93%	0.34%	NA
Internal Rate of Return on Incremental Investment	21.8%	NA	NA

Notes: 1) All dollar figures represent constant 1979 dollars.

2) Analyses performed using 70 cents/car-hour car-hire costs and includes labor protection payments as an operating cost.

3) NA - Not Applicable due to the fact that the incremental increase in capital cost is greater than the incremental increase in operating cost savings.

Exhibit 5.9: Overall Summary of Performance by Alternative

	Alternatives in the Year 2000			
	No Build	Two-Yard Directional	Three-Yard Directional	Three-Yard Bidirectional
Capital Cost ($000)	0	531,160	604,650	581,080
Annual Cars Handled (000's)	4,579	4,579	4,579	4,579
Annual Operating Cost ($000)	379,358	251,312	245,326	223,822
Per Car Operating Cost ($)				
Cars Switched	123.92	83.07	80.92	73.78
Cars Not Switched	6.63	2.59	2.83	2.67
All Cars	82.14	54.88	53.57	48.88
Net Present Value @ 10% ($000)	--	257,978*	227,395*	349,745*
Benefit/Cost Ratio @ 10%	--	1.68*	1.53*	1.85*
Internal Rate of Return	--	14.4*	13.6*	15.3*
Average Transit Time (hours)				
Base	39.5	31.5	28.7	24.3
Base Plus Delay	46.0	36.2	33.4	29.1
Reliability				
Percent Cars Meeting Schedule	78	82	82	84
Cars Delayed Daily	3,737	3,032	2,980	2,671

---

*Includes 70 cents/car-hour car-hire costs and labor protection payments.

Note: All dollar figures represent constant 1979 dollars.

summarizes the several measures. It indicates how each of the alternatives will perform in the year 2000 in terms of operating cost, time, and reliability.

The Three-Yard Bidirectional Alternative clearly performs the best. It has the lowest annual and per car operating cost, transit time, and number of cars delayed daily, and is highest in percent of cars meeting schedules, benefit-cost ratio and internal rate of return. This alternative does not have the lowest capital cost, but would cost some 50 million dollars more than the Two-Yard Alternative, which is the lowest. However, since the benefit-cost ratio and IRR are both higher than for the Two-Yard, the savings of the Three-Yard Bidirectional more than make up the difference.

A comparison between the Two-Yard Alternative and the Three-Yard Directional Alternative is mixed, with each alternative being better than the other in some of the measures of performance.

It should be noted that the benefit estimates do not account for the value of the lading on the rail cars which move through the system. The Build Alternatives substantially reduce the time spent in the system and would, in turn, reduce inventory costs for rail users. Inclusion of such inventory cost savings would increase the return on investment values. This point is discussed under "Economic Impacts" in the Draft Environmental Impact Statement.

In summary, the analysis has shown that there are substantial benefits to improvements at St. Louis; that all three of the restructuring alternatives are justifiable investments; and that, from the viewpoint of railroad operations analysis, the Three-Yard Bidirectional Alternative, in terms of railroad operational- and cost-effectiveness, is the best of the three alternatives studied.

5.3.2 Additional Considerations

In evaluating the results of the analysis of operational - and cost-effectiveness, there are several additional considerations which should be taken into account. These considerations are briefly discussed below.

Mergers

During the course of this study, several railroads operating in the study area have been or are currently involved in mergers and/or acquisitions. Because of the many uncertainties involved with most merger applications, the exact effects of potential mergers on overall railroad operations in the study area could not be determined with any accuracy, and therefore, were not explicitly considered in the operations and cost analyses for the study area. That is, the institutional, operational and cost structures of the railroads as they existed on the study day of March 30, 1979 served as the basis from which these analyses were conducted.

In the cases where merger applications had been filed (BN-SLSF, CSX, MP-UP and SSW acquisition of CRIP St. Louis-Tucumari Line), informal reviews of the operating plans contained in these applications were conducted. These reviews revealed that the primary impact of each of these mergers, on study area operations, would be modest increases in the levels of activity on certain corridor segments and in certain classification yards. In all cases, these increases in activity or traffic were determined to be of no material significance with respect to overall railroad operations in the study area.

Work Rules

The operations and cost analyses in this study were performed assuming that all current work rules and practices encompassed in existing national railroad labor agreements and government regulations would remain in effect. It is likely that certain changes in work rules would significantly improve railroad operating efficiency and reduce operating costs; however, this issue is, for the most part, separate from the specific concerns involved in the restructuring of physical facilities and operating plans within the study area. Changes in work rules in the future are not realistically predictable and because the same work rules and labor practices, either existing or changed, would apply to all restructuring alternatives, their effect on the relative performance of these alternatives should be negligible.

Impacts During Construction

The operational and cost impacts related to the actual construction involved in implementing any of the Build Alternatives have not been quantified as a part of this analysis. However, it has been the opinion of engineers in SEK and other parties that the impacts during construction activities associated with either of the Three-Yard Alternatives would be less than those for the Two-Yard Directional Alternative. The primary reason is that under the Three-Yard Alternatives, Madison Yard could continue to operating relatively unhindered during the construction of New Yard, as no significant amount of construction would take place in

Madison Yard in this case; whereas, under the Two-Yard Alternative, Madison Yard would be expanded and thus, involved in construction activity.

Although the impacts of construction on railroad operations may be of concern at certain points within the study area, the duration of the impacts at any one point will generally be short, as much of the construction activity may take place without significantly effecting operations, especially in the yards where the majority of construction will take place on the periphery of these facilities and may be conducted piecemeal. Also, the potential benefits (i.e., operational efficiency and cost savings) which might be realized after partial completion of yard and corridor improvements were not included in the analysis. This has resulted in a slight underestimation of the benefits associated with each of the Build Alternatives, which, overall, should tend to offset any negative impacts related to construction.

Value of Present Facilities

The value of railroad facilities currently in place in the study area has not been specifically determined. It is reasonable to believe that the value of these facilities to the railroads is significant. The strategic location of the study area in the national railroad system and the high levels of railroad activity in the area strongly suggest that the study area is a necessary part of the system and that its role in this system cannot be easily assumed by other parts of the system (i.e., other terminal and interchange points). The capital investment required to improve facilities and operations in the study area, especially when one considers the value or "sunk costs" associated with the existing facilities, potentially could prove to be a far more effective use of limited funds than capital investments which might need to be made in other areas in the railroad system, if these areas are to serve as reasonable alternatives to the St. Louis-East St. Louis Terminal Area.

National Benefits

CONSAD's work has not included the estimation of the national efficiency benefits that could come with improvements in St. Louis-East St. Louis. To the extent that such improvements would increase the efficiency, including delivery times, of the national railroad network, and to the extent that this would allow the railroad system to attract a greater share of the Nation's freight traffic from more costly and energy-consuming transport modes, there would be additional transportation benefits associated with the proposed Build Alternatives.

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APPENDIX A

Annotated List of CONSAD Working Papers

Working Paper No. 1, Identify Parameters of Phase II Study, April 17, 1979.

In order to initiate the operations analyses of the Phase II Study, it was necessary to define the key paramaters of the study. In conjunction with I-DOT and the Railroad TAC, CONSAD defined and addressed the following five major paramaters: definition of alternative restructuring plans to be analyzed; choice of a horizon year for planning; application of growth factors to railroad traffic data; specification of a data collection period; and plans for a joint intermodal facility. This working paper highlights the considerations made by CONSAD, I-DOT and the Railroad TAC in arriving at the definition of these paramaters and states the final position (s) eventually agreed upon by all parties.

Working Paper No. 2, Select Simulation Models, April 17, 1979.

In an effort to fully analyze the operational effectiveness of proposed restructuring alternatives it was necessary to simulate the movement of the traffic, trains, and cars, through the railroad yards and corridors within the terminal area, under each of the proposed alternatives. This working paper describes CONSAD's initial efforts to find appropriate yard and corridor simulation models or procedures to be applied to the St. Louis Terminal Area.

Working Paper No. 3, Compilation of Data Collected an Tabulated, January 11, 1980.

In support of its operations and cost analyses, CONSAD collected large volumes of detailed data from a variety of sources. This working paper summarizes and documents the data collected and tabulated by CONSAD for use in its analyses. The data presented here are of three major types, namely: data concerned with the volumes and composition of railroad traffic in the terminal area; equipment employed in the movement of this traffic, and information concerned with the physical facilities within the terminal area (i.e.: yards and corridor segments).

Working Paper No. 4, Corridor Analysis Procedure, December 18, 1979.

Because no computer model suitable for simulating the complex corridor operations within the terminal area was found to exist, CONSAD devised a manual analysis procedure which would trace the movements of trains within and through the terminal area and provide data to be used in the evaluation of corridor operations at projected levels of traffic and under the operating plans associated with the various proposed restructuring aternatives. In this working paper, the seven step corridor simulation/analysis process is discussed; information input to the analysis is identified; and the form and content of analytical output is described.

Working Paper No. 5, Criteria for Evaluation, December 14, 1979.

The purpose of this working paper was to document the methods for the evaluation of proposed restructuring alternatives and to serve as an aid in the refinement of analytic procedures for yard and corridor operations and cost analyses. Here, the system(s) of interest are defined and the development of specific criteria to be used as measures of operational effectiveness of yards and corridors are described. Finally, an approach is set forth for combining the evaluation of the two major subsystems, yards and corridors, to obtain measures of effectiveness for the gateway system as a whole.

Working Paper No. 6, Processing of Traffic Data, December 14, 1979.

A necessary ingredient in the evaluation of operational and cost impacts of restructuring railroad operation in the St. Louis Gateway was the analysis of current and projected future traffic flows within the through the terminal area, including interchange, overhead, and local industry traffic. This working paper describes the traffic data base used by CONSAD and the methods employed in collecting, processing and analyzing that data. Each of the four major components of this data base are discussed in the reports, specifically: Train consists, interchange reports, and tower sheets; Labor/Management Task Force/AAR data bases; projections of traffic data to horizon years (1985 and 2000); and assignment of projected inbound and outbound traffic to yards.

Working Paper No. 7, TOFC Analysis, December 21, 1979.

A major element involved with the restructuring of the St. Louis Railroad Gateway was the development of a plan for a common intermodal terminal facility. In this working paper the primary issues to be considered in the operational analysis of such a facility are discussed. These issues include: the volume and type of traffic to be handled; operational strategies to be employed (i.e.; loading and unloading equipment, type of switching, etc.); and the interfacing of this facility with other general classification yards.

Working Paper No. 8, Costing Methodology, December 18, 1979.

One of the critical elements in evaluating the restructuring plans for the St. Louis Gateway was the cost of operations to be incurred by all railroads and the relationship of that cost to the capital costs of implementing each plan. CONSAD researched various techniques for analyzing the cost of operations. In this working Paper, Section 2.0 describes the alternative approaches to cost estimation examined, their advantages and disadvantages in use and the approach selected on a basis of criteria established by CONSAD. Section 3.0 discusses the methodology proposed for estimation of operating costs and the process for implementing the methodology. Additionally, a sample application of the cost methodology is presented in an appendix.

Working Paper No. 9, Secondary Operating Issues, January 18, 1980.

In addition to the primary issues of yard and corridor capacity and efficiency, which were throughly analyzed, CONSAD also examined other "secondary" operating issues. This working paper describes these secondary operating issues and sets forth CONSAD's approach to addressing them. Included in this report are examinations of the following six key secondary operating issues: (1) train control and dispatch; (2) paper and data flow; (3) car servicing and repair; (4) locomotive servicing and repair; (5) crew support activities; and (6) trackage rights. Also, a number of other secondary operating issues of lesser importance are briefly touched upon.

Working Paper No. 10, Evaluation of Operations in the Two No Build Yards for the Year 1979, March 6, 1980.

This working paper documents the methods of analysis employed for the evaluation of operations in Madison and Gateway Yards in the Year 1979 under the "No Build" plan alternative, and presents the results of these analyses. The utilization of the Conrail Yard Model, including model input, mechanics, and output, are discussed; and CONSAD's general analytical procedures, along with the development of yard operating performance measures, are described. The information provided from this exercise aided in the formation of a basis for assessing the efficacy of proposed alternatives for yard operations within the Gateway.

Working Paper No. 11A, Evaluation of Operations in Madison and Gateway Yards Under the Two-Yard Plan for the Year 2000, April 11, 1980.

This working paper documents the processes involved in the analysis of operations in Madison and Gateway Yards for the year 2000 under the Two-Yard Alternative and presents the results of this analysis. Information on the physical facilities and configurations, operational policies and characteristics, and traffic bases of the two proposed yards are presented in an appendix. Additionally, relevant comparisons are made between the results of the yard operations analysis for this particular case and results obtained in the analysis of the "base case" (i.e., 1979 No Build), presented in CONSAD's Working Paper No. 10. These types of comparisons served as important tools in the overall evaluation of yard performance in future years and/or under various restructuring alternatives.

Working Paper No. 11B, Analysis of Operations in No Build Madison, Two Yard Madison and Three-Yard New Yards for the Years 1985 and 2000 May 23, 1980.

This working paper presents and documents the results of the analysis of operations in No Build and Two-Yard Madison Yards and Three-Yard New Yard for the years 1985 and 2000. Based on these results, relevant comparisons are made between the performances of the three alternative yard configurations, in relation to their traffic bases, for each of the two future years. Of primary interest here, is the performance of Three-Yard New Yard, in both absolute terms and relative to the performance of Madison Yard under the No Build and Two-Yard restructuring alternatives. Information concerning the yards' physical facilities, operational characteristics and traffic bases are also presented in an appendix to this report.

Working Paper No. 12, Analysis of Operations in No Build Two-Yard and, Three-Yard Gateway Yards for the Years 1985 and 2000, June 27, 1980.

This working paper presents and documents the results of the analysis of operations in No Build, Two-Yard, and Three-Yard Gateway Yards for the years 1985 and 2000. Based on these results, relevant comparisons are made between the performances of the alternative yard configurations, in relation to their traffic bases for each of the two future years. Of particular interest here, is the performance of the revised configuration of Gateway Yard, as expanded under the Two-Yard and Three-Yard restructuring alternatives. This revised plan for Gateway Yard, Phase II Plan Modified Alton and Southern Concept Study, replaced the Phase I Plan Concept Study for the Yard's expansion, which had been found to be operationally infeasible. Data concerned with the physical facilities, operational characteristics, and traffic base (s) of this revised configuration for Gateway Yard are also presented in an appendix to the report.

Working Paper No. 14 A, Evaluation of 1979 No Build Corridor Simulation, March 18, 1980,

In order to analyze corridor operations for the various restruturing alternatives and in various years, CONSAD simulated the everyday movement of trains over the terminal area corridor system. This simulation provided estimated measures of the operational performance for each train moving within the terminal area, as well as for individual components (line segments and stations) making-up the corridor network, and included: speed, running time, delay, and conflict with other train movements. The purpose of this working paper was to document the methods employed in this analysis of 1979 No Build corridor operations and to present the detailed results of the analysis. The information provided by this analysis served as a general basis for evaluating the operational effectiveness of other proposed alternatives for corridor operations within East St. Louis Terminal Area.

Working Paper No. 14 B, Evaluation of 2000 Two-Yard Corridor Simulation, March 18, 1980.

This working paper documents the methods employed in the analysis of corridor operations under the Two-Yard Alternative in the year 2000 and presents the results of the analysis. In addition to presenting the analtical results for the Two-Yard Alternative (Train performance, segment performance, and station delays), comparisons are made between the operational performance of the corridor system in the 1979 No Build base case and the 2000 Two-Yard case (by carrier, station and segment).

Working Paper No. 14 C, Evaluation of 2000 No Build and 2000 Three-Yard Corridor Simulations, April 18, 1980.

This working paper documents the methods employed in the analysis of corridor operations for the No Build and Three-Yard Alternatives in the year 2000 and presents the results of the analysis. In addition to presenting these primary analytical results, the following corridor operational comparisons are made: 1979 No Build vs. 2000 No Build; 2000 No Build vs. 2000 Two-Yard; 2000 No Build vs. 2000 Three-Yard; and 2000 Two-Yard vs. 2000 Three-Yard. (The types of analytical results and resultant comparisons are the same as those for Working Papers No. 14A and 14B). These types of comparisons helped to put the results of these analyses into perspective, by assessing the operational performance of these restructuring alternatives relative to one another and not simply in absolute terms.

Working Paper No.17, Approach to Cost-Effectiveness Analysis, April 21, 1980.

In order to fully evaluate the desirability of the various restructuring alternatives the operational effectiveness of these alternatives must be examined in relation to the costs (both operational and capital) which must be borne to achieve the projected levels of effectiveness for each alternative. This report builds upon Working Paper No. 5 - Criteria for Evaluation, and Working Pepar No.8 - Costing Methodology; and describes the approach employed by CONSAD to measure the "Cost-Effectiveness" of the several alternatives under analysis. Specifically, this working Paper addresses the following topics: the identification and method of estimation of relevant costs; measures of operational effectiveness; evaluation perspectives for cost-effectiveness at the system-wide and component (yards and corridors) levels; and the basis for assigning charges to individual operationsl entities (i.e.; line-haul carriers, terminal and switching companies, etc.) Additionally, a hypothetical example of the allocation of these terminal costs is provided in an appendix.

Working Paper No. 18, Approach to the Estimation of Reliability, June 2, 1980.

Reliability of service is an important measure of railroad operational effectiveness, and has been noted by shippers and receivers as a major factor in determing modal choice. Because of this, it was necessary to develop estimates of the level of service reliability that could be expected under the operating plans associated with each of the restructuring alternatives under study. This working paper describes the analytic approach employed by CONSAD in the estimation of the reliability of traffic movements through the St. Louis Gateway. Included in this description are: an outline of the specific procedures followed in the analysis; the type(s) of information input to the analysis; and the general form and content of the results derived from the analysis.

Working Paper No. 19, Analysis of Operations in the Proposed Common TOFC/COFC Facility for the Year 2000, September 2, 1980.

The purpose of this working paper was to present CONSAD's operational analysis of the proposed intermodal terminal facility with respect to its particular functions, traffic base, and available resources. An introduction, Section 1 of the report, generally describes the need for a facility of this type within the Terminal Area and lists the major functions that would be performed by the proposed facility. In Section 2 of this report, the basic methodologies employed in the operational analysis, the analytical bases thereof, and the related analytical assumptions are described. The summarized results of the analysis are provided in Section 3 and serve as the basis on which the operational effectiveness of the proposed facility is evaluated. In Section 4 of the report, an attempt is made to conceptualize the results of the analysis, deriving specific conclusions and making appropriate recommendations.

Working Paper No. 20, Analysis of the Feasibility of Three-Yard Bidirectional Operations, August 29, 1980.

Throughout the Phase II Study, the operational alternatives being considered in the railroad gateway restructuring plan had been predicated on a directional concept of operations. However, during the course of the study, several serious questions, concerning the overall effectiveness of operations under the directional concept, were raised. The RTAC suggested that bidirectional operations might alleviate these concerns, and asked if the physical facilities planned for the Three-Yard Directional Alternative would be suitable for bidirectional operations. In order to help answer this question, CONSAD undertook a general analysis of anticipated bidirectional yard and corridor operations under the Three-Yard Alternative, since this alternative would result in the most significant alterations to the traffic operations, and facilities within the Gateway. This working paper describes the analytical methods utilized to estimate yard and corridor traffic loadings under bidirectional operations, presents the results of this analysis, and compares these results with those of the previous operations analysis for the Three-Yard Directional Alternative. This provided the basis for making meaningful estimates as to what the specific operational characteristics might be in the case of the Three-Yard Bidirectional Alternative.

Working Paper No. 21, Revised Analysis of Common TOFC Operations October 3, 1980.

After a review of the results of the operations analysis for the proposed TOFC facility (Working Paper No. 19) by the TAC and other parties involved in the restructuring effort, several suggestions regarding facility design and operations arose and subsequently resulted in a revised design/configuration for this facility. This working paper presents CONSAD's revision of its original analysis of TOFC operations to reflect the facility changes incorporated into the modified TOFC design. The analytic methodologies employed and the general form and content of the results presented for this re-evaluation of TOFC operations are the same as those previously described in Working Paper No. 19.

Working Paper No.22, Reexamination of Secondary Operating Issues, October 3, 1980.

Because of the availibility of new information resulting from the detailed operations analyses and the issues which were raised in light of this information, CONSAD reexamined the major secondary operating issues which it had previously analyzed and presented in Working Paper No. 9. The purpose of this working paper is to present further relevant information and analyses concerned with these issues, so as to enable the participants in the study to proceed toward conclusions regarding facility designs. In this working paper, seven major issues of concern are specifically addressed, and these are: centralized traffic control; paper and data flow; car repair; road locomotive servicing and repair; switch power servicing requirements; crew support activities; and trackage rights.

Working Paper No. 23, Analysis of Operations in Bidirectional Three-Yard Gateway and New Yards for the Year 2000, November 3, 1980.

In addition to the general analysis of bidirectional operations within the Terminal Area (Working Paper No. 20), CONSAD performed a more detailed simulation and analysis of bidirectional yard operations. This working paper documents the methodologies employed in the analysis of operations in Three-Yard Bidirectional Gateway and New Yards for the year 2000 and presents the results of these analyses. Based on these results, relevant comparisons are made between the performance of the directional and bidirectional operating plans for yard configurations in relation to their traffic bases. Of particular interest here, is the relative operational effectiveness of the two-directional yard configurations under a bidirectional traffic load.

Special Report, Report on the Operational Analysis of Alternative Designs For Gateway Yard, April 18, 1980.

Due to serious questions regarding the operational feasibility of the original plan for the expansion of the Alton and Southern's Gateway Yard, CONSAD was commissioned by the Illinois Department of Transportation to perform an expeditious analysis of potential operations in several proposed alternatives for the redesign of Gateway Yard. This report documents the methods of analysis employed for the purpose of evaluating operations under the various yard design alternatives and presents the summary results of the analysis. These results served as general indicators of the relative operational effectiveness of each alternative configuration for Gateway Yard.

Memorandum re: Mississippi River Bridges, April 23, 1980.

This memorandum addresses the operational adequacy of the area's two existing railroad river bridges (Mac Arthur Bridge and McKinley Bridge) when functioning under projected year 2000 traffic levels. The memorandum presented data concerned with estimated bridge delays and transit times; and ultimately resulted in a decision by the Railroad Technical Advisory Committee to consider the McKinley Bridge as a part of the terminal corridor system, leaving open the possibility of the construction of a new bridge at some time in the future.

APPENDIX B

Classification Yard Detention Time

APPENDIX B: Classification Yard Detention Time

In this appendix, 20 series of tables, providing information on detention times for each year/alternative/yard combination analyzed, are presented. Each series is composed of six tables, showing total detention time and its element, in both aggregate car-hours and car-hours per car, for: Inbound Roads; Outbound Roads; Inbound Trains; Outbound Trains; Outbound Classifications; and Time of Day Intervals.* Yard totals and averages are also presented in the last line of each table.

A complete discussion of the yard simulation and analysis process, including specific definitions of detention time and its various elements, has been presented in Section 3.3.1, Yard Operations.

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*The inbound and outbound roads identified here are those which physically carried the cars in or out of the yard and do not necessarily imply car ownership, especially in the case of the three switch carriers (A&S, TRRA, and New Yard). Time of Day Intervals correspond to the following time periods:

INT 1 - 10:30 PM to 2:29 AM;
INT 2 - 2:30 AM to 6:29 AM;
INT 3 - 6:30 AM to 10:29 AM;
INT 4 - 10:30 AM to 2:29 PM;
INT 5 - 2:30 PM to 6:29 PM; and
INT 6 - 6:30 PM to 10:29 PM.

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B.1 Detention Time for 1979 No Build Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1979 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	457	117.0	969.6	4267.7	2014.9	301.1	7670.2	.3	2.1	9.3	4.4	.7	16.8
BN	128	0.	427.1	1774.3	549.6	51.0	2801.9	0.	3.3	13.9	4.3	.4	21.9
BO	93	0.	221.6	840.9	454.0	15.3	1531.9	0.	2.4	9.0	4.9	.2	16.5
CNW	37	0.	53.0	140.4	148.6	37.2	379.3	0.	1.4	3.8	4.0	1.0	10.3
CR	90	0.	216.5	1166.4	408.3	42.0	1833.2	0.	2.4	13.0	4.5	.5	20.4
ICG	67	0.	134.0	601.2	315.8	31.7	1082.6	0.	2.0	9.0	4.7	.5	16.2
MP	261	86.3	497.2	2957.2	1174.6	145.9	4861.2	.3	1.9	11.3	4.5	.6	18.6
MRS	23	0.	26.5	146.1	110.5	5.1	288.1	0.	1.2	6.4	4.8	.2	12.5
NW	149	0.	413.1	811.4	605.7	46.6	1876.8	0.	2.8	5.4	4.1	.3	12.6
SSW	441	65.3	941.6	5288.2	2035.6	200.4	8531.2	.1	2.1	12.0	4.6	.5	19.3
TRRA	20	0.	22.0	244.7	90.0	10.5	367.3	0.	1.1	12.2	4.5	.5	18.4
TOTAL	1766	268.5	3922.2	18238.5	7907.4	887.0	31223.5	.2	2.2	10.3	4.5	.5	17.7

1979 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	726	81.5	1758.5	6813.4	3044.4	487.0	12184.8	.1	2.4	9.4	4.2	.7	16.8
BN	83	26.1	166.8	734.4	348.6	66.4	1342.2	.3	2.0	8.8	4.2	.8	16.2
BO	212	49.8	421.5	2225.6	1049.3	62.2	3808.3	.2	2.0	10.5	4.9	.3	18.0
CNW	150	17.4	297.6	1708.2	745.9	49.3	2818.3	.1	2.0	11.4	5.0	.3	18.8
CR	182	34.2	356.9	2579.0	928.1	1.5	3899.7	.2	2.0	14.2	5.1	.0	21.4
LN	32	.9	71.0	448.5	78.4	81.6	680.4	.0	2.2	14.0	2.5	2.6	21.3
MRS	74	23.1	194.0	713.2	293.5	33.3	1257.2	.3	2.6	9.6	4.0	.5	17.0
NW	91	12.9	178.6	1091.6	327.7	100.0	1710.8	.1	2.0	12.0	3.6	1.1	18.8
SSW	216	22.8	477.4	1924.7	1091.5	5.7	3522.0	.1	2.2	8.9	5.1	.0	16.3
TOTAL	1766	268.5	3922.2	18238.5	7907.4	887.0	31223.5	.2	2.2	10.3	4.5	.5	17.7

1979 No Build Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2G01	43	19.4	71.0	610.1	198.2	22.5	921.2	.5	1.7	14.2	4.6	.5	21.4
2G03	81	0.	185.9	519.2	424.2	8.5	1137.6	0.	2.3	6.4	5.2	.1	14.0
4G02	90	0.	216.5	1166.4	408.3	42.0	1833.2	0.	2.4	13.0	4.5	.5	20.4
4G04	93	0.	221.6	840.9	454.0	15.3	1531.9	0.	2.4	9.0	4.9	.2	16.5
5G02	130	0.	364.0	1310.9	535.6	127.9	2338.4	0.	2.8	10.1	4.1	1.0	18.0
7G02	19	3.5	20.9	265.1	83.5	12.3	385.4	.2	1.1	14.0	4.4	.6	20.3
9G03	20	9.7	24.7	214.8	92.7	10.9	352.8	.5	1.2	10.7	4.6	.5	17.6
DG03	69	17.3	130.0	593.3	309.3	40.2	1090.0	.3	1.9	8.6	4.5	.6	15.8
DG05	90	69.0	195.0	1061.9	395.6	59.2	1780.8	.8	2.2	11.8	4.4	.7	19.8
DG07	32	0.	41.6	510.9	147.0	16.8	716.3	0.	1.3	16.0	4.6	.5	22.4
DG09	70	0.	130.7	791.1	322.6	29.7	1274.1	0.	1.9	11.3	4.6	.4	18.2
GG05	20	0.	22.0	164.3	78.6	21.8	286.7	0.	1.1	8.2	3.9	1.1	14.3
LG02	93	66.7	220.3	884.0	402.1	42.0	1615.0	.7	2.4	9.5	4.3	.5	17.4
LG04	128	0.	427.1	1774.3	549.6	51.0	2801.9	0.	3.3	13.9	4.3	.4	21.9
LG16	24	8.4	28.0	45.7	80.3	39.8	202.1	.4	1.2	1.9	3.3	1.7	8.4
LG92	149	0.	413.1	811.4	605.7	46.6	1876.8	0.	2.8	5.4	4.1	.3	12.6
MV12	20	0.	22.0	244.7	90.0	10.5	367.3	0.	1.1	12.2	4.5	.5	18.4
OG02	37	0.	53.0	140.4	148.6	37.2	379.3	0.	1.4	3.8	4.0	1.0	10.3
FG01	23	0.	26.5	146.1	110.5	5.1	288.1	0.	1.2	6.4	4.8	.2	12.5
SG01	27	9.5	32.9	253.6	119.7	15.4	431.1	.3	1.2	9.4	4.4	.6	16.0
VG21	67	0.	134.0	601.2	315.8	31.7	1082.6	0.	2.0	9.0	4.7	.5	16.2
VV10	12	1.0	12.0	179.0	59.5	1.8	253.2	.1	1.0	14.9	5.0	.1	21.1
XG01	88	0.	199.5	1295.4	393.1	47.8	1935.7	0.	2.3	14.7	4.5	.5	22.0
XG03	73	17.0	204.4	941.6	317.2	53.1	1533.3	.2	2.8	12.9	4.3	.7	21.0
XG05	81	12.2	185.0	875.0	383.5	31.2	1486.8	.2	2.3	10.8	4.7	.4	18.4
XG07	49	0.	75.1	604.6	241.4	9.8	930.9	0.	1.5	12.3	4.9	.2	19.0
XG09	36	9.0	77.4	419.3	162.9	19.0	687.6	.3	2.2	11.6	4.5	.5	19.1
XG11	58	26.1	99.6	541.0	269.9	22.5	959.0	.5	1.7	9.3	4.7	.4	16.5
XG13	44	0.	88.7	432.5	208.1	15.3	744.6	0.	2.0	9.8	4.7	.3	16.9
TOTAL	1766	268.5	3922.2	18238.5	7907.4	887.0	31223.5	.2	2.2	10.3	4.5	.5	17.7

1979 No Build Gateway Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
D505	87	11.8	161.3	1086.4	385.7	49.3	1694.5	.1	1.9	12.5	4.4	.6	19.5
G301	32	.9	71.0	448.5	78.4	81.6	680.4	.0	2.2	14.0	2.5	2.6	21.3
G401	89	15.0	164.5	1394.3	456.9	1.5	2032.2	.2	1.8	15.7	5.1	.0	22.8
G403	93	19.1	192.4	1184.8	471.2	0.	1867.5	.2	2.1	12.7	5.1	0.	20.1
G491	91	23.0	163.3	1110.7	395.9	62.2	1754.9	.3	1.8	12.2	4.4	.7	19.3
G493	121	26.8	258.2	1114.9	653.4	0.	2053.3	.2	2.1	9.2	5.4	0.	17.0
G571	63	5.6	136.3	621.7	360.2	0.	1123.8	.1	2.2	9.9	5.7	0.	17.8
G701	26	8.6	58.6	392.7	79.7	34.2	573.8	.3	2.3	15.1	3.1	1.3	22.1
G902	26	0.	81.5	76.7	88.8	0.	247.0	0.	3.1	2.9	3.4	0.	9.5
GD08	76	0.	199.9	725.6	305.3	74.7	1305.5	0.	2.6	9.5	4.0	1.0	17.2
GD12	76	0.	194.7	144.8	315.4	0.	654.9	0.	2.6	1.9	4.1	0.	8.6
GF01	20	0.	56.0	94.3	44.3	54.0	248.7	0.	2.8	4.7	2.2	2.7	12.4
GG05	2	0.	4.4	5.9	3.8	6.2	20.3	0.	2.2	3.0	1.9	3.1	10.2
GG10	51	.8	159.2	924.1	203.2	25.5	1312.7	.0	3.1	18.1	4.0	.5	25.7
GL01	53	7.4	104.0	678.4	227.1	17.7	1034.5	.1	2.0	12.8	4.3	.3	19.5
GL03	38	5.6	74.6	413.1	100.7	82.3	676.3	.1	2.0	10.9	2.6	2.2	17.8
GL05	83	26.1	166.8	734.4	348.6	66.4	1342.2	.3	2.0	8.8	4.2	.8	16.2
GL08	21	2.7	54.7	251.6	74.2	30.8	413.9	.1	2.6	12.0	3.5	1.5	19.7
GF02	74	23.1	194.0	713.2	293.5	33.3	1257.2	.3	2.6	9.6	4.0	.5	17.0
GP04	21	4.8	46.5	278.7	83.3	19.6	432.9	.2	2.2	13.3	4.0	.9	20.6
GR01	88	14.1	181.9	1033.2	418.0	22.0	1669.2	.2	2.1	11.7	4.8	.3	19.0
GR03	62	15.9	137.6	841.4	228.4	81.6	1304.8	.3	2.2	13.6	3.7	1.3	21.0
GR05	71	9.5	149.5	1130.3	338.4	16.6	1644.3	.1	2.1	15.9	4.8	.2	23.2
GS01	73	3.4	173.1	264.6	422.2	0.	863.3	.0	2.4	3.6	5.8	0.	11.8
GS05	56	21.1	90.6	167.7	184.8	95.2	559.4	.4	1.6	3.0	3.3	1.7	10.0
GV54	57	.7	170.4	481.9	254.6	26.6	934.1	.0	3.0	8.5	4.5	.5	16.4
VX06	113	21.0	254.0	1134.7	559.4	5.7	1974.7	.2	2.2	10.0	4.9	.0	17.5
VX92	103	1.8	223.3	790.0	532.2	0.	1547.3	.0	2.2	7.7	5.2	0.	15.0
TOTAL	1766	268.5	3922.2	18238.5	7907.4	887.0	31223.5	.2	2.2	10.3	4.5	.5	17.7

1979 No Build Gateway Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	83	26.1	166.8	734.4	348.6	66.4	1342.2	.3	2.0	8.8	4.2	.8	16.2
BOC	34	4.3	55.1	412.6	147.9	23.2	643.1	.1	1.6	12.1	4.4	.7	18.9
BOK	57	18.7	108.2	698.1	248.0	39.0	1111.9	.3	1.9	12.2	4.4	.7	19.5
BOT	121	26.8	258.2	1114.9	653.4	0.	2053.3	.2	2.1	9.2	5.4	0.	17.0
CEI	21	2.7	54.7	251.6	74.2	30.8	413.9	.1	2.6	12.0	3.5	1.5	19.7
CRAN	88	14.1	181.9	1033.2	418.0	22.0	1669.2	.2	2.1	11.7	4.8	.3	19.0
CRBF	62	15.9	137.6	841.4	228.4	81.6	1304.8	.3	2.2	13.6	3.7	1.3	21.0
CRC	93	19.1	192.4	1184.8	471.2	0.	1867.5	.2	2.1	12.7	5.1	0.	20.1
CREN	89	15.0	164.5	1394.3	456.9	1.5	2032.2	.2	1.8	15.7	5.1	.0	22.8
CRST	71	9.5	149.5	1130.3	338.4	16.6	1644.3	.1	2.1	15.9	4.8	.2	23.2
CWFK	87	11.8	161.3	1086.4	385.7	49.3	1694.5	.1	1.9	12.5	4.4	.6	19.5
CWVO	63	5.6	136.3	621.7	360.2	0.	1123.8	.1	2.2	9.9	5.7	0.	17.8
IC	57	.7	170.4	481.9	254.6	26.6	934.1	.0	3.0	8.5	4.5	.5	16.4
INDY	77	.8	240.7	1000.8	292.0	25.5	1559.7	.0	3.1	13.0	3.8	.3	20.3
ITC	26	8.6	58.6	392.7	79.7	34.2	573.8	.3	2.3	15.1	3.1	1.3	22.1
LNNA	32	.9	71.0	448.5	78.4	81.6	680.4	.0	2.2	14.0	2.5	2.6	21.3
MFD	152	0.	394.6	870.3	620.7	74.7	1960.4	0.	2.6	5.7	4.1	.5	12.9
MFW	74	23.1	194.0	713.2	293.5	33.3	1257.2	.3	2.6	9.6	4.0	.5	17.0
MRS	21	4.8	46.5	278.7	83.3	19.6	432.9	.2	2.2	13.3	4.0	.9	20.6
NWBE	35	4.0	71.2	404.7	148.2	11.7	639.7	.1	2.0	11.6	4.2	.3	18.3
NWDK	20	2.6	40.1	223.3	49.7	43.3	358.9	.1	2.0	11.2	2.5	2.2	17.9
NWDT	18	3.0	34.5	189.9	51.0	39.0	317.4	.2	1.9	10.5	2.8	2.2	17.6
NWFK	18	3.4	32.8	273.7	78.9	6.0	394.8	.2	1.8	15.2	4.4	.3	21.9
SFO	20	0.	56.0	94.3	44.3	54.0	248.7	0.	2.8	4.7	2.2	2.7	12.4
SOU	131	24.5	268.1	438.2	610.8	101.4	1443.0	.2	2.0	3.3	4.7	.8	11.0
SSW	216	22.8	477.4	1924.7	1091.5	5.7	3522.0	.1	2.2	8.9	5.1	.0	16.3
TOTAL	1766	268.5	3922.2	18238.5	7907.4	887.0	31223.5	.2	2.2	10.3	4.5	.5	17.7

1979 No Build Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	160	0.	468.7	2285.2	696.6	67.8	3518.2	0.	2.9	14.3	4.4	.4	22.0
INT-2	239	0.	573.6	1558.6	1031.9	83.5	3247.5	0.	2.4	6.5	4.3	.3	13.6
INT-3	310	3.5	680.5	3812.6	1428.9	128.0	6053.4	.0	2.2	12.3	4.6	.4	19.5
INT-4	282	115.8	568.2	3186.7	1238.9	189.2	5298.9	.4	2.0	11.3	4.4	.7	18.8
INT-5	484	140.2	915.3	4713.6	2180.3	247.9	8197.2	.3	1.9	9.7	4.5	.5	16.9
INT-6	291	9.0	716.0	2681.8	1330.8	170.7	4908.3	.0	2.5	9.2	4.6	.6	16.9
TOTAL	1766	268.5	3922.2	18238.5	7907.4	887.0	31223.5	.2	2.2	10.3	4.5	.5	17.7

B.2 Detention Time for 1985 No Build Gateway Yard By:

- Inbound Road
- Outbound Road
- Inbound Train
- Outbound Train
- Outbound Classification
- Time of Day Interval

1985 No Build Gateway Yard

			Aggregate Car Hours					Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	368	101.0	806.8	3223.7	1666.0	211.0	6008.4	.3	2.2	8.8	4.5	.6	16.3
BN	139	0.	410.5	1187.4	598.9	29.9	2226.7	0.	3.0	8.5	4.3	.2	16.0
BO	107	0.	290.2	884.1	471.2	39.5	1684.9	0.	2.7	8.3	4.4	.4	15.7
CNW	146	0.	413.7	1487.0	565.2	70.0	2535.9	0.	2.8	10.2	3.9	.5	17.4
CR	99	0.	244.2	1353.4	426.2	38.2	2062.0	0.	2.5	13.7	4.3	.4	20.8
ICG	78	0.	154.7	384.3	373.1	48.5	960.6	0.	2.0	4.9	4.8	.6	12.3
MP	233	21.6	586.1	2521.1	1023.0	156.9	4308.6	.1	2.5	10.8	4.4	.7	18.5
MRS	27	0.	32.4	184.4	126.8	18.2	361.8	0.	1.2	6.8	4.7	.7	13.4
NW	170	0.	535.1	1137.0	732.3	17.6	2421.9	0.	3.1	6.7	4.3	.1	14.2
SSW	526	262.0	1390.5	6600.9	2377.9	316.6	10948.0	.5	2.6	12.5	4.5	.6	20.8
TRRA	79	0.	127.0	686.6	330.2	66.0	1209.9	0.	1.6	8.7	4.2	.8	15.3
TOTAL	1972	384.5	4991.2	19649.8	8690.8	1012.3	34728.7	.2	2.5	10.0	4.4	.5	17.6

1985 No Build Gateway Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	951	161.2	2445.0	8297.3	4032.0	442.2	15377.6	.2	2.6	8.7	4.2	.5	16.2
BN	88	28.9	208.0	1079.3	365.2	74.8	1756.2	.3	2.4	12.3	4.1	.8	20.0
BO	184	48.2	477.0	1980.7	913.0	71.5	3490.5	.3	2.6	10.8	5.0	.4	19.0
CNW	88	10.8	190.0	634.5	472.3	48.4	1355.9	.1	2.2	7.2	5.4	.5	15.4
CR	192	55.2	524.9	2892.8	985.2	103.5	4561.7	.3	2.7	15.1	5.1	.5	23.8
LN	37	.2	96.1	506.9	98.0	87.0	788.2	.0	2.6	13.7	2.7	2.4	21.3
MRS	83	27.3	233.1	848.2	385.6	0.	1494.2	.3	2.8	10.2	4.6	0.	18.0
NW	101	28.9	231.1	1384.6	334.3	67.0	2045.9	.3	2.3	13.7	3.3	.7	20.3
SSW	248	23.8	586.1	2025.4	1105.3	118.1	3858.7	.1	2.4	8.2	4.5	.5	15.6
TOTAL	1972	384.5	4991.2	19649.8	8690.8	1012.3	34728.7	.2	2.5	10.0	4.4	.5	17.6

1985 No Build Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2G01	46	3.1	141.1	718.9	216.4	40.6	1119.9	.1	3.1	15.6	4.7	.9	24.3
2G03	87	0.	191.4	732.7	412.2	38.0	1374.3	0.	2.2	8.4	4.7	.4	15.8
4G02	99	0.	244.2	1353.4	426.2	38.2	2062.0	0.	2.5	13.7	4.3	.4	20.8
4G04	107	0.	290.2	884.1	471.2	39.5	1684.9	0.	2.7	8.3	4.4	.4	15.7
5G02	146	0.	413.7	1487.0	565.2	70.0	2535.9	0.	2.8	10.2	3.9	.5	17.4
5G12	55	0.	99.0	399.6	223.9	47.4	769.9	0.	1.8	7.3	4.1	.9	14.0
7G02	20	2.7	35.3	281.9	100.0	8.5	428.5	.1	1.8	14.1	5.0	.4	21.4
9G03	24	11.6	34.0	143.8	124.9	0.	314.3	.5	1.4	6.0	5.2	0.	13.1
DG03	60	15.0	126.0	491.2	264.9	34.2	931.3	.3	2.1	8.2	4.4	.6	15.5
DG05	79	6.6	310.4	856.6	353.8	54.6	1581.9	.1	3.9	10.8	4.5	.7	20.0
DG07	34	0.	44.8	544.8	155.0	19.3	763.8	0.	1.3	16.0	4.6	.6	22.5
DG09	60	0.	105.0	628.5	249.4	48.8	1031.7	0.	1.8	10.5	4.2	.8	17.2
GG05	24	0.	28.4	183.3	99.8	27.2	338.7	0.	1.2	7.6	4.2	1.1	14.1
LG02	106	77.7	261.1	833.9	474.1	30.5	1677.3	.7	2.5	7.9	4.5	.3	15.8
LG04	139	0.	410.5	1187.4	598.9	29.9	2226.7	0.	3.0	8.5	4.3	.2	16.0
LG16	29	4.8	44.0	53.3	105.6	39.4	247.1	.2	1.5	1.8	3.6	1.4	8.5
LG92	170	0.	535.1	1137.0	732.3	17.6	2421.9	0.	3.1	6.7	4.3	.1	14.2
MV12	24	0.	28.0	287.0	106.3	18.7	440.0	0.	1.2	12.0	4.4	.8	18.3
FG01	27	0.	32.4	184.4	126.8	18.2	361.8	0.	1.2	6.8	4.7	.7	13.4
SG01	32	1.1	71.5	275.9	133.1	26.8	508.3	.0	2.2	8.6	4.2	.8	15.9
VG21	78	0.	154.7	384.3	373.1	48.5	960.6	0.	2.0	4.9	4.8	.6	12.3
VV10	15	0.	41.8	224.5	68.3	4.7	339.2	0.	2.8	15.0	4.6	.3	22.6
XG01	112	179.2	377.3	1577.6	484.9	69.5	2688.5	1.6	3.4	14.1	4.3	.6	24.0
XG03	85	31.2	329.8	1134.5	407.6	39.7	1942.6	.4	3.9	13.3	4.8	.5	22.9
XG05	92	7.7	225.4	1026.9	418.0	57.5	1735.4	.1	2.5	11.2	4.5	.6	18.9
XG07	57	0.	96.0	734.9	265.6	32.0	1128.3	0.	1.7	12.9	4.7	.6	19.8
XG09	45	12.0	90.8	497.5	198.7	28.1	827.0	.3	2.0	11.1	4.4	.6	18.4
XG11	71	32.0	134.9	944.5	310.5	54.3	1476.0	.5	1.9	13.3	4.4	.8	20.8
XG13	49	0.	94.7	460.8	224.6	30.9	811.0	0.	1.9	9.4	4.6	.6	16.6
TOTAL	1972	384.5	4991.2	19649.8	8690.8	1012.3	34728.7	.2	2.5	10.0	4.4	.5	17.6

1985 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
G301	37	.2	96.1	506.9	98.0	87.0	788.2	.0	2.6	13.7	2.7	2.4	21.3
G401	95	30.9	268.3	1645.2	506.7	0.	2451.1	.3	2.8	17.3	5.3	0.	25.8
G403	97	24.3	256.6	1247.6	478.5	103.5	2110.6	.3	2.6	12.9	4.9	1.1	21.8
G405	43	7.8	92.4	699.4	167.7	47.3	1014.6	.2	2.1	16.3	3.9	1.1	23.6
G491	74	13.4	184.9	907.9	335.5	71.5	1513.2	.2	2.5	12.3	4.5	1.0	20.4
G493	110	34.8	292.1	1072.9	577.5	0.	1977.2	.3	2.7	9.8	5.3	0.	18.0
G505	83	3.6	188.7	929.6	345.8	69.2	1536.9	.0	2.3	11.2	4.2	.8	18.5
G571	88	10.8	190.0	634.5	472.3	48.4	1355.9	.1	2.2	7.2	5.4	.5	15.4
G701	29	6.7	75.5	405.2	129.1	16.0	632.3	.2	2.6	14.0	4.4	.6	21.8
GD12	87	0.	256.7	184.2	410.4	0.	851.1	0.	3.0	2.1	4.7	0.	9.8
GD14	92	4.9	242.5	1002.8	412.5	16.9	1679.5	.1	2.6	10.9	4.5	.2	18.3
GF01	32	0.	92.1	323.6	96.5	18.1	530.4	0.	2.9	10.1	3.0	.6	16.6
GG02	25	0.	80.7	111.3	87.1	0.	279.1	0.	3.2	4.5	3.5	0.	11.2
GG10	46	0.	98.1	32.2	188.6	0.	318.9	0.	2.1	.7	4.1	0.	6.9
GL01	59	20.9	135.1	902.7	201.2	8.9	1268.7	.4	2.3	15.3	3.4	.2	21.5
GL03	42	8.1	96.0	481.9	133.1	58.1	777.2	.2	2.3	11.5	3.2	1.4	18.5
GL05	88	28.9	208.0	1079.3	365.2	74.8	1756.2	.3	2.4	12.3	4.1	.8	20.0
GL08	19	8.2	52.4	207.1	52.6	0.	320.3	.4	2.8	10.9	2.8	0.	16.9
GP02	83	27.3	233.1	848.2	385.6	0.	1494.2	.3	2.8	10.2	4.6	0.	18.0
GP04	24	14.3	62.1	364.4	70.0	0.	510.8	.6	2.6	15.2	2.9	0.	21.3
GR01	95	28.9	246.2	1021.8	467.1	0.	1764.0	.3	2.6	10.8	4.9	0.	18.6
GR03	86	19.3	195.7	721.1	388.4	84.6	1409.0	.2	2.3	8.4	4.5	1.0	16.4
GR05	79	42.7	215.5	1140.8	325.2	102.7	1827.0	.5	2.7	14.4	4.1	1.3	23.1
GS01	81	4.0	181.9	274.1	407.7	0.	867.7	.0	2.2	3.4	5.0	0.	10.7
GS05	64	20.2	146.4	166.3	232.5	87.5	652.9	.3	2.3	2.6	3.6	1.4	10.2
GV54	66	.7	218.1	713.6	250.8	0.	1183.2	.0	3.3	10.8	3.8	0.	17.9
VX02	83	23.3	198.9	475.8	357.7	23.5	1079.3	.3	2.4	5.7	4.3	.3	13.0
VX06	93	0.	210.6	1159.8	428.4	57.4	1856.2	0.	2.3	12.5	4.6	.6	20.0
VX92	72	.5	176.5	389.9	319.2	37.2	923.2	.0	2.5	5.4	4.4	.5	12.8
TOTAL	1972	384.5	4991.2	19649.8	8690.8	1012.3	34728.7	.2	2.5	10.0	4.4	.5	17.6

1985 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	88	28.9	208.0	1079.3	365.2	74.8	1756.2	.3	2.4	12.3	4.1	.8	20.0
BOC	30	1.0	65.6	404.9	136.0	29.0	636.5	.0	2.2	13.5	4.5	1.0	21.2
BOK	44	12.4	119.3	503.0	199.5	42.5	876.7	.3	2.7	11.4	4.5	1.0	19.9
BOT	110	34.8	292.1	1072.9	577.5	0.	1977.2	.3	2.7	9.8	5.3	0.	18.0
BOW	43	7.8	92.4	699.4	167.7	47.3	1014.6	.2	2.1	16.3	3.9	1.1	23.6
CEI	19	8.2	52.4	207.1	52.6	0.	320.3	.4	2.8	10.9	2.8	0.	16.9
CRAN	95	28.9	246.2	1021.8	467.1	0.	1764.0	.3	2.6	10.8	4.9	0.	18.6
CRBF	19	10.5	60.8	202.4	85.8	18.7	378.2	.6	3.2	10.7	4.5	1.0	19.9
CRC	97	24.3	256.6	1247.6	478.5	103.5	2110.6	.3	2.6	12.9	4.9	1.1	21.8
CREN	95	30.9	268.3	1645.2	506.7	0.	2451.1	.3	2.8	17.3	5.3	0.	25.8
CRSE	67	8.8	134.9	518.7	302.6	65.9	1030.8	.1	2.0	7.7	4.5	1.0	15.4
CRST	79	42.7	215.5	1140.8	325.2	102.7	1827.0	.5	2.7	14.4	4.1	1.3	23.1
CWFK	83	3.6	188.7	929.6	345.8	69.2	1536.9	.0	2.3	11.2	4.2	.8	18.5
CWVO	88	10.8	190.0	634.5	472.3	48.4	1355.9	.1	2.2	7.2	5.4	.5	15.4
IC	66	.7	218.1	713.6	250.8	0.	1183.2	.0	3.3	10.8	3.8	0.	17.9
INDY	71	0.	178.9	143.5	275.7	0.	598.0	0.	2.5	2.0	3.9	0.	8.4
ITC	29	6.7	75.5	405.2	129.1	16.0	632.3	.2	2.6	14.0	4.4	.6	21.8
LNNA	37	.2	96.1	506.9	98.0	87.0	788.2	.0	2.6	13.7	2.7	2.4	21.3
MPD	179	4.9	499.2	1186.9	822.8	16.9	2530.6	.0	2.8	6.6	4.6	.1	14.1
MFW	83	27.3	233.1	848.2	385.6	0.	1494.2	.3	2.8	10.2	4.6	0.	18.0
MRS	24	14.3	62.1	364.4	70.0	0.	510.8	.6	2.6	15.2	2.9	0.	21.3
NWBE	40	17.6	94.5	586.0	122.0	6.0	826.1	.4	2.4	14.6	3.1	.2	20.7
NWDK	18	2.0	40.1	228.7	45.9	24.9	341.5	.1	2.2	12.7	2.6	1.4	19.0
NWDT	24	6.1	56.0	253.2	87.2	33.2	435.7	.3	2.3	10.6	3.6	1.4	18.2
NWFK	19	3.3	40.6	316.8	79.2	2.9	442.6	.2	2.1	16.7	4.2	.2	23.3
SFO	32	0.	92.1	323.6	96.5	18.1	530.4	0.	2.9	10.1	3.0	.6	16.6
SOU	145	24.2	328.3	440.4	640.2	87.5	1520.6	.2	2.3	3.0	4.4	.6	10.5
SSW	248	23.8	586.1	2025.4	1105.3	118.1	3858.7	.1	2.4	8.2	4.5	.5	15.6
TOTAL	1972	384.5	4991.2	19649.8	8690.8	1012.3	34728.7	.2	2.5	10.0	4.4	.5	17.6

1985 No Build Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	173	0.	455.3	1732.2	753.8	49.1	2990.5	0.	2.6	10.0	4.4	.3	17.3
INT-2	275	0.	722.2	1705.7	1232.2	84.3	3744.3	0.	2.6	6.2	4.5	.3	13.6
INT-3	362	181.9	975.1	4384.0	1588.7	174.4	7304.0	.5	2.7	12.1	4.4	.5	20.2
INT-4	312	41.9	993.4	3609.8	1402.9	213.7	6261.7	.1	3.2	11.6	4.5	.7	20.1
INT-5	523	148.8	1054.8	5040.2	2312.6	323.8	8880.1	.3	2.0	9.6	4.4	.6	17.0
INT-6	327	12.0	790.5	3177.9	1400.6	167.1	5548.2	.0	2.4	9.7	4.3	.5	17.0
TOTAL	1972	384.5	4991.2	19649.8	8690.8	1012.3	34728.7	.2	2.5	10.0	4.4	.5	17.6

B.3 Detention Time for 2000 No Build Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

2000 No Build Gateway Yard

Inbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	495	557.3	1216.6	5206.2	2133.0	253.7	9366.8	1.1	2.5	10.5	4.3	.5	18.9
BN	102	130.9	279.8	826.5	388.9	40.8	1666.8	1.3	2.7	8.1	3.8	.4	16.3
BO	112	0.	288.3	1213.2	468.2	71.3	2041.0	0.	2.6	10.8	4.2	.6	18.2
CNW	151	186.2	508.2	1289.2	590.0	53.2	2626.7	1.2	3.4	8.5	3.9	.4	17.4
CR	66	0.	132.8	532.4	295.8	79.2	1040.2	0.	2.0	8.1	4.5	1.2	15.8
ICG	111	114.7	303.8	852.9	436.4	132.2	1840.1	1.0	2.7	7.7	3.9	1.2	16.6
MP	182	109.8	383.1	1987.1	817.2	120.6	3417.7	.6	2.1	10.9	4.5	.7	18.8
MRS	41	0.	58.1	263.6	143.6	27.5	492.7	0.	1.4	6.4	3.5	.7	12.0
NW	101	0.	253.2	903.1	335.6	68.9	1560.7	0.	2.5	8.9	3.3	.7	15.5
SSW	829	358.3	2763.0	7403.7	3784.7	394.8	14704.6	.4	3.3	8.9	4.6	.5	17.7
TRRA	111	0.	234.3	657.7	527.0	63.5	1482.5	0.	2.1	5.9	4.7	.6	13.4
TOTAL	2301	1457.2	6421.1	21135.5	9920.3	1305.6	40239.7	.6	2.8	9.2	4.3	.6	17.5

2000 No Build Gateway Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	1226	722.6	3356.0	11857.2	5367.7	657.4	21960.9	.6	2.7	9.7	4.4	.5	17.9
BN	118	87.3	351.6	1692.0	625.4	141.6	2897.9	.7	3.0	14.3	5.3	1.2	24.6
BO	147	85.5	462.9	875.5	710.5	4.2	2138.6	.6	3.1	6.0	4.8	.0	14.5
CNW	109	67.7	327.8	561.2	452.6	83.1	1492.5	.6	3.0	5.1	4.2	.8	13.7
CR	182	109.5	573.2	1950.8	857.1	85.8	3576.5	.6	3.1	10.7	4.7	.5	19.7
LN	55	36.5	171.3	666.2	234.7	40.3	1149.0	.7	3.1	12.1	4.3	.7	20.9
MRS	91	54.6	254.6	1002.5	301.4	22.4	1635.5	.6	2.8	11.0	3.3	.2	18.0
NW	135	79.1	347.8	1461.5	516.6	102.4	2507.4	.6	2.6	10.8	3.8	.8	18.6
SSW	163	155.2	370.6	794.4	622.6	32.9	1975.7	1.0	2.3	4.9	3.8	.2	12.1
TRRA	75	59.1	205.3	274.3	231.8	135.4	905.9	.8	2.7	3.7	3.1	1.8	12.1
TOTAL	2301	1457.2	6421.1	21135.5	9920.3	1305.6	40239.7	.6	2.8	9.2	4.3	.6	17.5

2000 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2G01	84	40.6	207.2	1092.9	381.0	39.6	1761.2	.5	2.5	13.0	4.5	.5	21.0
2G03	94	131.6	253.7	435.3	458.7	9.8	1289.1	1.4	2.7	4.6	4.9	.1	13.7
4G02	66	0.	132.8	532.4	295.8	79.2	1040.2	0.	2.0	8.1	4.5	1.2	15.8
4G04	112	0.	288.3	1213.2	468.2	71.3	2041.0	0.	2.6	10.8	4.2	.6	18.2
5G02	151	186.2	508.2	1289.2	590.0	53.2	2626.7	1.2	3.4	8.5	3.9	.4	17.4
5G12	70	0.	176.2	281.8	313.0	26.7	797.7	0.	2.5	4.0	4.5	.4	11.4
7G02	26	5.6	38.1	242.8	100.0	42.4	429.0	.2	1.5	9.3	3.8	1.6	16.5
9G03	37	19.1	93.1	173.5	157.9	2.0	445.7	.5	2.5	4.7	4.3	.1	12.0
DG03	42	0.	84.7	478.3	203.8	22.0	788.7	0.	2.0	11.4	4.9	.5	18.8
DG05	52	41.6	84.9	592.1	220.6	52.3	991.6	.8	1.6	11.4	4.2	1.0	19.1
DG07	47	68.2	76.8	436.5	215.7	34.6	831.7	1.5	1.6	9.3	4.6	.7	17.7
DG09	41	0.	136.7	480.3	177.1	11.7	805.7	0.	3.3	11.7	4.3	.3	19.7
GG05	37	0.	58.6	551.8	163.8	0.	774.1	0.	1.6	14.9	4.4	0.	20.9
LG02	151	352.3	460.0	1553.8	583.9	70.6	3020.7	2.3	3.0	10.3	3.9	.5	20.0
LG04	102	130.9	279.8	826.5	388.9	40.8	1666.8	1.3	2.7	8.1	3.8	.4	16.3
LG16	45	0.	75.8	994.0	180.9	76.5	1327.1	0.	1.7	22.1	4.0	1.7	29.5
LG92	101	0.	253.2	903.1	335.6	68.9	1560.7	0.	2.5	8.9	3.3	.7	15.5
MV12	41	0.	58.1	375.9	214.0	36.8	684.8	0.	1.4	9.2	5.2	.9	16.7
FG01	41	0.	58.1	263.6	143.6	27.5	492.7	0.	1.4	6.4	3.5	.7	12.0
SG01	21	8.1	30.1	162.2	106.8	12.8	320.0	.4	1.4	7.7	5.1	.6	15.2
VG21	111	114.7	303.8	852.9	436.4	132.2	1840.1	1.0	2.7	7.7	3.9	1.2	16.6
VV10	24	3.2	29.6	166.7	93.6	34.0	327.0	.1	1.2	6.9	3.9	1.4	13.6
XG01	93	0.	201.5	677.6	367.3	50.5	1296.9	0.	2.2	7.3	3.9	.5	13.9
XG03	128	29.9	407.8	1409.4	608.5	92.2	2547.8	.2	3.2	11.0	4.8	.7	19.9
XG05	151	85.6	504.6	1316.2	694.7	65.1	2666.2	.6	3.3	8.7	4.6	.4	17.7
XG07	90	42.0	318.3	1108.3	409.2	51.8	1929.5	.5	3.5	12.3	4.5	.6	21.4
XG09	68	113.3	261.8	537.7	303.2	24.9	1240.9	1.7	3.8	7.9	4.5	.4	18.2
XG11	110	84.3	493.1	1161.5	493.7	45.8	2278.3	.8	4.5	10.6	4.5	.4	20.7
XG13	84	0.	369.6	642.8	396.9	22.2	1431.4	0.	4.4	7.7	4.7	.3	17.0
XG72	81	0.	176.9	383.6	417.7	8.5	986.6	0.	2.2	4.7	5.2	.1	12.2
TOTAL	2301	1457.2	6421.1	21135.5	9920.3	1305.6	40239.7	.6	2.8	9.2	4.3	.6	17.5

2000 No Build Gateway Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
G301	55	36.5	171.3	666.2	234.7	40.3	1149.0	.7	3.1	12.1	4.3	.7	20.9
G401	75	48.7	261.7	742.6	315.0	28.8	1396.7	.6	3.5	9.9	4.2	.4	18.6
G403	107	60.9	311.6	1208.2	542.1	57.1	2179.8	.6	2.9	11.3	5.1	.5	20.4
G405	94	21.1	216.4	1508.4	416.7	0.	2162.7	.2	2.3	16.0	4.4	0.	23.0
G407	88	75.5	275.7	436.5	409.2	0.	1196.8	.9	3.1	5.0	4.6	0.	13.6
G491	84	52.9	256.8	654.7	443.8	0.	1408.2	.6	3.1	7.8	5.3	0.	16.8
G493	63	32.6	206.2	220.8	266.7	4.2	730.5	.5	3.3	3.5	4.2	.1	11.6
G501	66	23.3	208.9	476.7	332.2	0.	1041.0	.4	3.2	7.2	5.0	0.	15.8
G505	111	106.1	310.0	1654.2	586.5	70.3	2727.0	1.0	2.8	14.9	5.3	.6	24.6
G571	43	44.4	119.0	84.6	120.4	83.1	451.5	1.0	2.8	2.0	2.8	1.9	10.5
G701	39	39.2	131.1	445.1	105.3	50.7	771.4	1.0	3.4	11.4	2.7	1.3	19.8
G902	9	0.	19.2	13.1	19.8	8.0	60.0	0.	2.1	1.5	2.2	.9	6.7
GD08	102	0.	234.7	693.3	474.3	137.7	1539.9	0.	2.3	6.8	4.7	1.4	15.1
GD12	27	33.4	72.5	164.1	68.8	15.8	354.6	1.2	2.7	6.1	2.6	.6	13.1
GD22	35	49.7	123.0	108.4	123.1	4.1	408.2	1.4	3.5	3.1	3.5	.1	11.7
GE21	59	36.9	184.2	446.9	210.4	0.	878.4	.6	3.1	7.6	3.6	0.	14.9
GF01	77	45.6	213.4	889.2	319.6	0.	1467.8	.6	2.8	11.5	4.2	0.	19.1
GG10	28	13.2	86.3	284.6	94.7	.9	479.7	.5	3.1	10.2	3.4	.0	17.1
GL01	65	29.5	172.8	645.6	230.8	3.3	1081.9	.5	2.7	9.9	3.6	.1	16.6
GL03	70	49.6	175.0	815.9	285.8	99.2	1425.5	.7	2.5	11.7	4.1	1.4	20.4
GL05	118	87.3	351.6	1692.0	625.4	141.6	2897.9	.7	3.0	14.3	5.3	1.2	24.6
GL08	27	20.7	91.2	218.2	99.9	8.1	438.1	.8	3.4	8.1	3.7	.3	16.2
GP02	35	28.6	93.9	357.9	99.8	0.	580.1	.8	2.7	10.2	2.9	0.	16.6
GP04	74	112.5	201.1	673.1	278.7	55.5	1321.0	1.5	2.7	9.1	3.8	.8	17.9
GP06	56	26.0	160.7	644.7	201.6	22.4	1055.4	.5	2.9	11.5	3.6	.4	18.8
GR01	102	36.2	291.4	791.4	465.8	146.2	1730.9	.4	2.9	7.8	4.6	1.4	17.0
GR03	92	44.1	292.9	757.9	397.1	15.3	1507.3	.5	3.2	8.2	4.3	.2	16.4
GR05	110	44.6	322.2	1132.0	685.7	0.	2184.4	.4	2.9	10.3	6.2	0.	19.9
GR09	40	9.5	82.3	165.9	108.7	131.3	497.7	.2	2.1	4.1	2.7	3.3	12.4
GS01	72	62.1	160.3	296.9	318.0	0.	837.3	.9	2.2	4.1	4.4	0.	11.6
GS05	71	15.3	127.8	1141.0	279.3	146.7	1710.1	.2	1.8	16.1	3.9	2.1	24.1
GV54	44	16.2	125.8	311.4	137.9	2.2	593.5	.4	2.9	7.1	3.1	.0	13.5
VX02	49	97.8	120.2	62.8	157.6	.8	439.2	2.0	2.5	1.3	3.2	.0	9.0
VX06	37	13.2	61.5	143.9	100.5	32.1	351.1	.4	1.7	3.9	2.7	.9	9.5
VX92	77	44.2	188.9	587.8	364.5	0.	1185.3	.6	2.5	7.6	4.7	0.	15.4
TOTAL	2301	1457.2	6421.1	21135.5	9920.3	1305.6	40239.7	.6	2.8	9.2	4.3	.6	17.5

2000 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	118	87.3	351.6	1692.0	625.4	141.6	2897.9	.7	3.0	14.3	5.3	1.2	24.6
BOC	28	1.1	49.6	496.5	124.1	0.	671.4	.0	1.8	17.7	4.4	0.	24.0
BOK	59	36.9	184.2	446.9	210.4	0.	878.4	.6	3.1	7.6	3.6	0.	14.9
BOT	213	105.5	629.8	1887.3	1003.1	4.2	3629.9	.5	3.0	8.9	4.7	.0	17.0
CEI	27	20.7	91.2	218.2	99.9	8.1	438.1	.8	3.4	8.1	3.7	.3	16.2
CRAN	128	85.0	358.0	602.3	517.9	131.3	1694.5	.7	2.8	4.7	4.0	1.0	13.2
CRBF	30	9.3	106.8	221.9	160.5	5.0	503.5	.3	3.6	7.4	5.4	.2	16.8
CRC	107	60.9	311.6	1208.2	542.1	57.1	2179.8	.6	2.9	11.3	5.1	.5	20.4
CREN	177	84.8	553.1	1534.0	780.8	175.0	3127.6	.5	3.1	8.7	4.4	1.0	17.7
CRSE	62	34.8	186.1	536.0	236.6	10.3	1003.8	.6	3.0	8.6	3.8	.2	16.2
CRST	110	44.6	322.2	1132.0	685.7	0.	2184.4	.4	2.9	10.3	6.2	0.	19.9
CWPK	111	106.1	310.0	1654.2	586.5	70.3	2727.0	1.0	2.8	14.9	5.3	.6	24.6
CWVO	109	67.7	327.8	561.2	452.6	83.1	1492.5	.6	3.0	5.1	4.2	.8	13.7
IC	44	16.2	125.8	311.4	137.9	2.2	593.5	.4	2.9	7.1	3.1	.0	13.5
INDY	37	13.2	105.5	297.7	114.5	8.9	539.7	.4	2.9	8.0	3.1	.2	14.6
ITC	39	39.2	131.1	445.1	105.3	50.7	771.4	1.0	3.4	11.4	2.7	1.3	19.8
LNNA	55	36.5	171.3	666.2	234.7	40.3	1149.0	.7	3.1	12.1	4.3	.7	20.9
MPD	164	83.0	430.1	965.8	666.2	157.5	2302.7	.5	2.6	5.9	4.1	1.0	14.0
MPW	130	138.5	361.7	1317.8	480.3	77.9	2376.3	1.1	2.8	10.1	3.7	.6	18.3
MRS	35	28.6	93.9	357.9	99.8	0.	580.1	.8	2.7	10.2	2.9	0.	16.6
NWBE	35	7.1	90.1	314.6	110.3	1.8	523.8	.2	2.6	9.0	3.2	.1	15.0
NWDK	30	21.3	82.7	380.0	102.5	42.5	628.9	.7	2.8	12.7	3.4	1.4	21.0
NWDT	40	28.4	92.3	435.9	183.3	56.7	796.5	.7	2.3	10.9	4.6	1.4	19.9
NWFK	30	22.5	82.7	331.0	120.5	1.5	558.1	.7	2.8	11.0	4.0	.1	18.6
SFO	77	45.6	213.4	889.2	319.6	0.	1467.8	.6	2.8	11.5	4.2	0.	19.1
SOU	143	77.3	288.1	1438.0	597.3	146.7	2547.4	.5	2.0	10.1	4.2	1.0	17.8
SSW	163	155.2	370.6	794.4	622.6	32.9	1975.7	1.0	2.3	4.9	3.8	.2	12.1
TOTAL	2301	1457.2	6421.1	21135.5	9920.3	1305.6	40239.7	.6	2.8	9.2	4.3	.6	17.5

2000 No Build Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Time of Day Interval	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	230	199.1	533.4	1646.5	1022.3	83.8	3485.1	.9	2.3	7.2	4.4	.4	15.2
INT-2	253	114.7	615.1	2019.5	915.6	228.6	3893.5	.5	2.4	8.0	3.6	.9	15.4
INT-3	338	5.6	718.9	3041.9	1445.3	280.1	5491.8	.0	2.1	9.0	4.3	.8	16.2
INT-4	379	123.3	935.8	3705.1	1723.5	257.6	6745.3	.3	2.5	9.8	4.5	.7	17.8
INT-5	704	583.4	2224.7	7817.5	3064.9	345.5	14036.0	.8	3.2	11.1	4.4	.5	19.9
INT-6	397	431.2	1393.2	2905.0	1748.7	110.0	6588.1	1.1	3.5	7.3	4.4	.3	16.6
TOTAL	2301	1457.2	6421.1	21135.5	9920.3	1305.6	40239.7	.6	2.8	9.2	4.3	.6	17.5

B.4 Detention Time for 1985 Two-Yard Directional Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1985 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	275	52.9	933.5	2570.0	1216.4	225.1	4997.8	.2	3.4	9.3	4.4	.8	18.2
BN	141	0.	792.0	902.2	614.2	83.7	2392.0	0.	5.6	6.4	4.4	.6	17.0
CNW	305	26.3	1021.6	2142.2	1282.2	279.7	4752.0	.1	3.3	7.0	4.2	.9	15.6
ICG	141	77.2	391.8	1147.4	676.6	69.7	2362.7	.5	2.8	8.1	4.8	.5	16.8
MKT	74	38.2	333.0	634.5	323.5	54.8	1384.0	.5	4.5	8.6	4.4	.7	18.7
MP	319	54.3	1485.2	2828.3	1420.6	171.1	5959.5	.2	4.7	8.9	4.5	.5	18.7
MRS	28	.9	161.9	346.4	120.9	16.5	646.6	.0	5.8	12.4	4.3	.6	23.1
NW	127	0.	372.0	1453.3	567.1	75.3	2467.7	0.	2.9	11.4	4.5	.6	19.4
SLSF	633	179.5	2327.5	5752.5	2620.6	603.6	11483.8	.3	3.7	9.1	4.1	1.0	18.1
SOU	293	65.1	799.8	2077.5	1137.1	408.5	4487.9	.2	2.7	7.1	3.9	1.4	15.3
SSW	530	107.7	1705.8	4549.4	2398.2	287.2	9048.2	.2	3.2	8.6	4.5	.5	17.1
TRRA	344	19.6	1510.8	2272.2	1468.9	285.6	5557.1	.1	4.4	6.6	4.3	.8	16.2
TOTAL	3210	621.8	11834.9	26675.8	13846.2	2560.8	55539.4	.2	3.7	8.3	4.3	.8	17.3

1985 Two-Yard Directional Gateway Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	1053	188.3	3802.5	8354.4	4153.4	1171.5	17670.1	.2	3.6	7.9	3.9	1.1	16.8
BN	53	26.4	177.8	236.3	266.8	1.8	709.0	.5	3.4	4.5	5.0	.0	13.4
BO	324	49.1	1249.2	2837.2	1368.5	136.0	5639.9	.2	3.9	8.8	4.2	.4	17.4
CNW	292	92.6	946.8	2452.8	1504.2	26.8	5023.2	.3	3.2	8.4	5.2	.1	17.2
CR	679	127.8	2728.3	4817.5	3120.6	476.4	11270.6	.2	4.0	7.1	4.6	.7	16.6
LN	174	26.0	552.4	1653.5	645.6	231.2	3108.7	.1	3.2	9.5	3.7	1.3	17.9
MP	79	14.3	283.1	1143.1	361.5	111.9	1914.0	.2	3.6	14.5	4.6	1.4	24.2
MRS	25	3.4	69.1	320.5	58.8	41.3	493.0	.1	2.8	12.8	2.4	1.7	19.7
NW	145	34.0	548.2	1589.3	604.9	67.4	2843.8	.2	3.8	11.0	4.2	.5	19.6
SOU	341	46.4	1343.2	3135.6	1612.1	221.5	6358.8	.1	3.9	9.2	4.7	.6	18.6
TRRA	45	13.5	134.3	135.8	150.0	75.0	508.5	.3	3.0	3.0	3.3	1.7	11.3
TOTAL	3210	621.8	11834.9	26675.8	13846.2	2560.8	55539.4	.2	3.7	8.3	4.3	.8	17.3

1985 Two-Yard Directional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-502	147	0.	463.1	968.5	638.0	123.0	2192.6	0.	3.2	6.6	4.3	.8	14.9
-N01	74	38.2	333.0	634.5	323.5	54.8	1384.0	.5	4.5	8.6	4.4	.7	18.7
-S02	124	0.	341.0	977.2	456.4	184.4	1959.0	0.	2.8	7.9	3.7	1.5	15.8
-S04	122	44.7	364.0	816.9	499.9	163.8	1889.3	.4	3.0	6.7	4.1	1.3	15.5
-S06	47	20.4	94.8	283.4	180.8	60.3	639.6	.4	2.0	6.0	3.8	1.3	13.6
2G01	61	4.1	119.0	800.8	286.8	35.4	1246.1	.1	2.0	13.1	4.7	.6	20.4
2G03	95	0.	509.8	724.0	468.5	44.9	1747.2	0.	5.4	7.6	4.9	.5	18.4
5G02	158	26.3	558.5	1173.7	644.2	156.7	2559.4	.2	3.5	7.4	4.1	1.0	16.2
6207	44	19.8	105.6	446.1	165.4	31.6	768.5	.5	2.4	10.1	3.8	.7	17.5
6211	102	85.0	406.3	830.1	445.3	85.9	1852.6	.8	4.0	8.1	4.4	.8	18.2
6213	75	0.	316.3	783.7	323.9	58.4	1482.2	0.	4.2	10.4	4.3	.8	19.8
6215	102	0.	251.6	729.9	386.6	113.0	1481.0	0.	2.5	7.2	3.8	1.1	14.5
6219	74	0.	223.2	599.6	253.1	125.0	1200.9	0.	3.0	8.1	3.4	1.7	16.2
6221	91	53.1	314.0	1013.8	410.5	65.8	1857.2	.6	3.5	11.1	4.5	.7	20.4
6223	37	1.9	73.4	438.3	161.0	4.2	678.7	.1	2.0	11.8	4.4	.1	18.3
6225	108	19.8	637.2	911.0	474.9	119.7	2162.6	.2	5.9	8.4	4.4	1.1	20.0
6M01	85	12.8	512.8	432.4	373.2	35.4	1366.5	.2	6.0	5.1	4.4	.4	16.1
7G02	43	23.7	74.5	358.0	154.6	77.1	687.9	.5	1.7	8.3	3.6	1.8	16.0
9G03	13	5.2	40.3	108.6	49.5	18.3	221.9	.4	3.1	8.4	3.8	1.4	17.1
AG16	40	12.7	132.0	435.4	150.7	34.5	765.3	.3	3.3	10.9	3.8	.9	19.1
CG03	46	.8	184.0	278.2	176.1	61.0	700.1	.0	4.0	6.0	3.8	1.3	15.2
CG05	32	5.9	85.3	43.6	148.3	0.	283.1	.2	2.7	1.4	4.6	0.	8.8
DG03	83	41.5	412.2	827.0	382.7	39.1	1702.5	.5	5.0	10.0	4.6	.5	20.5
DG05	85	0.	242.3	785.1	386.0	30.3	1443.7	0.	2.9	9.2	4.5	.4	17.0
DG07	66	0.	317.9	783.8	278.7	66.3	1446.8	0.	4.8	11.9	4.2	1.0	21.9
GG05	23	7.3	57.9	143.1	106.3	14.9	329.6	.3	2.5	6.2	4.6	.6	14.3
LG04	141	0.	792.0	902.2	614.2	83.7	2392.0	0.	5.6	6.4	4.4	.6	17.0
MG02	78	13.0	232.7	580.4	334.6	65.4	1226.2	.2	3.0	7.4	4.3	.8	15.7
MG04	73	0.	511.0	471.8	360.8	22.8	1366.3	0.	7.0	6.5	4.9	.3	18.7
MG06	54	0.	175.5	502.9	231.5	42.0	951.9	0.	3.3	9.3	4.3	.8	17.6
MG08	61	0.	322.3	395.2	217.7	94.5	1029.6	0.	5.3	6.5	3.6	1.5	16.9
FG19	28	.9	161.9	346.4	120.9	16.5	646.6	.0	5.8	12.4	4.3	.6	23.1

1985 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
3-01	56	2.4	212.9	273.0	198.8	84.0	771.1	.0	3.8	4.9	3.6	1.5	13.8
3-03	72	7.4	213.7	1171.3	318.0	0.	1710.4	.1	3.0	16.3	4.4	0.	23.8
5-03	85	24.7	323.9	904.2	371.1	0.	1623.9	.3	3.8	10.6	4.4	0.	19.1
5-05	115	37.4	314.8	601.8	605.7	26.8	1586.5	.3	2.7	5.2	5.3	.2	13.8
E471	79	10.9	382.0	720.8	366.0	0.	1479.7	.1	4.8	9.1	4.6	0.	18.7
E491	51	11.0	190.1	774.7	195.5	110.5	1281.8	.2	3.7	15.2	3.8	2.2	25.1
E493	80	6.9	199.7	215.8	372.0	0.	794.3	.1	2.5	2.7	4.7	0.	9.9
G204	39	4.9	147.0	366.6	119.6	94.9	733.0	.1	3.8	9.4	3.1	2.4	18.8
G301	46	16.3	125.8	209.1	128.8	147.2	627.2	.4	2.7	4.5	2.8	3.2	13.6
G401	99	18.0	511.8	965.3	585.8	9.9	2090.7	.2	5.2	9.8	5.9	.1	21.1
G403	54	20.5	173.5	223.0	216.9	57.6	691.5	.4	3.2	4.1	4.0	1.1	12.8
G491	69	7.7	301.8	584.3	303.6	0.	1197.4	.1	4.4	8.5	4.4	0.	17.4
G493	45	12.6	175.7	541.6	131.4	25.5	886.8	.3	3.9	12.0	2.9	.6	19.7
G501	92	30.5	308.1	946.8	527.5	0.	1812.9	.3	3.3	10.3	5.7	0.	19.7
G701	58	17.2	202.3	743.2	226.2	121.8	1310.7	.3	3.5	12.8	3.9	2.1	22.6
G902	36	0.	188.3	121.8	99.0	81.0	490.1	0.	5.2	3.4	2.8	2.3	13.6
GA08	30	0.	82.5	210.0	83.5	48.0	424.0	0.	2.8	7.0	2.8	1.6	14.1
GC03	61	11.8	196.4	285.9	234.9	49.8	778.7	.2	3.2	4.7	3.9	.8	12.8
GC40	45	13.5	134.3	135.8	150.0	75.0	508.5	.3	3.0	3.0	3.3	1.7	11.3
GD08	28	10.1	75.9	127.8	64.9	89.1	367.8	.4	2.7	4.6	2.3	3.2	13.1
GD12	61	10.3	224.8	464.7	205.4	95.6	1000.8	.2	3.7	7.6	3.4	1.6	16.4
GG02	10	.2	29.9	173.5	27.5	16.5	247.7	.0	3.0	17.3	2.8	1.7	24.8
GL01	74	12.0	309.2	891.5	312.0	58.0	1582.6	.2	4.2	12.0	4.2	.8	21.4
GL03	71	22.0	239.1	697.8	292.9	9.5	1261.2	.3	3.4	9.8	4.1	.1	17.8
GL05	53	26.4	177.8	236.3	266.8	1.8	709.0	.5	3.4	4.5	5.0	.0	13.4
GM01	60	15.6	199.8	471.0	211.0	25.0	922.3	.3	3.3	7.8	3.5	.4	15.4
GM03	61	10.6	162.1	804.1	266.4	0.	1243.3	.2	2.7	13.2	4.4	0.	20.4
GM05	77	17.5	398.2	263.1	379.9	0.	1058.6	.2	5.2	3.4	4.9	0.	13.7
GM07	47	.9	130.1	182.7	162.2	72.8	548.6	.0	2.8	3.9	3.5	1.6	11.7
GM09	24	2.3	67.2	105.3	66.8	53.2	294.8	.1	2.8	4.4	2.8	2.2	12.3
GM11	39	0.	117.7	276.9	120.3	74.8	589.6	0.	3.0	7.1	3.1	1.9	15.1
GP02	25	3.4	69.1	320.5	58.8	41.3	493.0	.1	2.8	12.8	2.4	1.7	19.7

1985 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
VG01	73	35.3	176.4	623.6	377.2	21.0	1233.5	.5	2.4	8.5	5.2	.3	16.9
VG03	68	41.9	215.3	523.8	299.4	48.7	1129.2	.6	3.2	7.7	4.4	.7	16.6
WG03	82	0.	199.5	1089.6	382.4	25.2	1696.7	0.	2.4	13.3	4.7	.3	20.7
WG05	45	0.	172.5	363.7	184.7	50.2	771.0	0.	3.8	8.1	4.1	1.1	17.1
XG01	113	15.1	329.6	1402.4	477.6	81.6	2306.3	.1	2.9	12.4	4.2	.7	20.4
XG03	85	0.	187.0	597.1	380.6	33.3	1198.0	0.	2.2	7.0	4.5	.4	14.1
XG05	93	0.	260.4	837.0	433.9	42.6	1573.9	0.	2.8	9.0	4.7	.5	16.9
XG07	56	25.2	208.1	406.3	252.7	29.0	921.3	.5	3.7	7.3	4.5	.5	16.5
XG09	45	0.	266.3	326.8	221.2	21.6	835.8	0.	5.9	7.3	4.9	.5	18.6
XG11	70	47.8	240.3	407.4	329.9	31.3	1056.8	.7	3.4	5.8	4.7	.4	15.1
XG13	49	19.6	178.0	384.0	226.3	34.5	842.4	.4	3.6	7.8	4.6	.7	17.2
XG21	19	0.	36.1	188.4	76.0	13.3	313.8	0.	1.9	9.9	4.0	.7	16.5
TOTAL	3210	621.8	11834.9	26675.8	13846.2	2560.8	55539.4	.2	3.7	8.3	4.3	.8	17.3

1985 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
GR01	102	21.9	284.3	608.3	547.4	10.2	1472.1	.2	2.8	6.0	5.4	.1	14.4
GV02	80	14.1	273.6	629.0	368.0	72.0	1356.7	.2	3.4	7.9	4.6	.9	17.0
GV04	44	5.6	262.6	149.6	159.1	27.9	604.7	.1	6.0	3.4	3.6	.6	13.7
GW01	72	20.0	258.7	862.6	332.1	64.8	1538.1	.3	3.6	12.0	4.6	.9	21.4
GW03	38	17.9	128.5	388.6	119.7	103.9	758.6	.5	3.4	10.2	3.2	2.7	20.0
GX11	86	7.4	372.8	1119.9	359.8	70.2	1930.0	.1	4.3	13.0	4.2	.8	22.4
L-01	79	14.3	283.1	1143.1	361.5	111.9	1914.0	.2	3.6	14.5	4.6	1.4	24.2
R401	60	7.5	257.1	781.6	214.0	76.0	1336.2	.1	4.3	13.0	3.6	1.3	22.3
R403	49	4.6	254.1	186.2	176.4	89.0	710.3	.1	5.2	3.8	3.6	1.8	14.5
R405	75	13.0	260.9	966.4	387.7	0.	1628.1	.2	3.5	12.9	5.2	0.	21.7
R407	72	26.1	277.1	407.9	292.8	31.2	1035.1	.4	3.8	5.7	4.1	.4	14.4
R409	91	16.0	429.5	704.2	561.2	0.	1710.9	.2	4.7	7.7	6.2	0.	18.8
R411	64	14.6	178.5	245.6	283.7	68.3	790.6	.2	2.8	3.8	4.4	1.1	12.4
R471	60	4.1	150.8	182.1	227.0	17.0	581.0	.1	2.5	3.0	3.8	.3	9.7
RL01	55	3.5	235.2	155.1	175.1	127.4	696.2	.1	4.3	2.8	3.2	2.3	12.7
S-01	69	12.8	228.6	529.0	289.8	55.2	1115.4	.2	3.3	7.7	4.2	.8	16.2
S-03	55	10.2	200.1	528.8	207.6	107.3	1053.9	.2	3.6	9.6	3.8	2.0	19.2
S-05	85	3.5	322.3	694.1	442.0	0.	1461.8	.0	3.8	8.2	5.2	0.	17.2
S-81	86	7.6	407.9	562.6	478.7	0.	1456.8	.1	4.7	6.5	5.6	0.	16.9
S-83	46	12.4	184.4	821.2	194.0	59.0	1270.9	.3	4.0	17.9	4.2	1.3	27.6
TOTAL	3210	621.8	11834.9	26675.8	13846.2	2560.8	55539.4	.2	3.7	8.3	4.3	.8	17.3

1985 Two-Yard Directional Gateway Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	127	38.3	487.0	1127.8	578.8	59.7	2291.6	.3	3.8	8.9	4.6	.5	18.0
BQC	213	38.3	755.1	1159.6	954.9	57.6	2965.5	.2	3.5	5.4	4.5	.3	13.9
BODA	34	9.7	131.4	434.4	90.1	19.3	684.9	.3	3.9	12.8	2.7	.6	20.1
BOK	69	7.7	301.8	584.3	303.6	0.	1197.4	.1	4.4	8.5	4.4	0.	17.4
BOW	51	11.0	190.1	774.7	195.5	110.5	1281.8	.2	3.7	15.2	3.8	2.2	25.1
BOWA	11	3.0	44.3	107.2	41.3	6.2	201.9	.3	4.0	9.7	3.8	.6	18.4
CAVE	106	25.3	330.6	421.7	384.9	124.8	1287.2	.2	3.1	4.0	3.6	1.2	12.1
CD	60	15.6	199.8	471.0	211.0	25.0	922.3	.3	3.3	7.8	3.5	.4	15.4
CRAN	210	34.0	843.1	1104.9	1020.0	195.7	3197.7	.2	4.0	5.3	4.9	.9	15.2
CRBF	19	2.0	53.7	197.7	111.5	0.	364.9	.1	2.8	10.4	5.9	0.	19.2
CRC	201	39.9	796.1	1573.6	1133.2	20.1	3562.8	.2	4.0	7.8	5.6	.1	17.7
CREN	181	34.8	682.0	776.2	696.2	137.2	2326.4	.2	3.8	4.3	3.8	.8	12.9
CRSE	56	11.0	207.2	768.7	276.3	0.	1263.1	.2	3.7	13.7	4.9	0.	22.6
CRST	60	7.5	257.1	781.6	214.0	76.0	1336.2	.1	4.3	13.0	3.6	1.3	22.3
CWIA	22	9.5	69.0	302.7	109.6	0.	490.8	.4	3.1	13.8	5.0	0.	22.3
CWFK	178	52.6	569.6	1203.3	867.1	26.8	2719.5	.3	3.2	6.8	4.9	.2	15.3
CWVO	92	30.5	308.1	946.8	527.5	0.	1812.9	.3	3.3	10.3	5.7	0.	19.7
FOX	36	0.	188.3	121.8	99.0	81.0	490.1	0.	5.2	3.4	2.8	2.3	13.6
GCE	116	17.5	515.8	540.0	500.1	74.8	1648.2	.2	4.4	4.7	4.3	.6	14.2
GCST	30	0.	82.5	210.0	83.5	48.0	424.0	0.	2.8	7.0	2.8	1.6	14.1
IC	124	19.7	536.1	778.6	527.1	99.9	1961.4	.2	4.3	6.3	4.3	.8	15.8
INDY	34	2.6	97.1	278.8	94.3	69.7	542.4	.1	2.9	8.2	2.8	2.1	16.0
ITC	58	17.2	202.3	743.2	226.2	121.8	1310.7	.3	3.5	12.8	3.9	2.1	22.6
LNEV	72	7.4	213.7	1171.3	318.0	0.	1710.4	.1	3.0	16.3	4.4	0.	23.8
LNNA	102	18.6	338.7	482.2	327.6	231.2	1398.3	.2	3.3	4.7	3.2	2.3	13.7
MAD	108	11.5	292.2	986.8	428.5	72.8	1791.8	.1	2.7	9.1	4.0	.7	16.6
MFCH	68	13.6	239.3	968.7	309.4	96.3	1627.3	.2	3.5	14.2	4.6	1.4	23.9
MFD	89	20.5	300.8	592.5	270.2	184.7	1368.6	.2	3.4	6.7	3.0	2.1	15.4
MFVG	11	.7	43.9	174.4	52.1	15.6	286.7	.1	4.0	15.9	4.7	1.4	26.1
MFW	39	4.9	147.0	366.6	119.6	94.9	733.0	.1	3.8	9.4	3.1	2.4	18.8
MRS	25	3.4	69.1	320.5	58.8	41.3	493.0	.1	2.8	12.8	2.4	1.7	19.7
NWBE	49	15.4	162.4	509.3	189.5	6.5	883.0	.3	3.3	10.4	3.9	.1	18.0
NWDK	49	16.1	173.1	599.2	214.8	44.1	1047.2	.3	3.5	12.2	4.4	.9	21.4

1985 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NWDT	23	3.9	85.7	263.4	117.3	20.7	490.9	.2	3.7	11.5	5.1	.9	21.3
NWSC	22	6.7	76.7	188.4	103.4	2.9	378.1	.3	3.5	8.6	4.7	.1	17.2
NWW	38	17.9	128.5	388.6	119.7	103.9	758.6	.5	3.4	10.2	3.2	2.7	20.0
SOCG	86	7.6	407.9	562.6	478.7	0.	1456.8	.1	4.7	6.5	5.6	0.	16.9
SODA	29	7.1	77.2	124.6	117.5	56.6	382.9	.2	2.7	4.3	4.1	2.0	13.2
SOKN	85	3.5	322.3	694.1	442.0	0.	1461.8	.0	3.8	8.2	5.2	0.	17.2
SOLO	46	12.4	184.4	821.2	194.0	59.0	1270.9	.3	4.0	17.9	4.2	1.3	27.6
SOMA	26	3.2	122.9	404.1	90.1	50.7	671.0	.1	4.7	15.5	3.5	2.0	25.8
SOFR	69	12.8	228.6	529.0	289.8	55.2	1115.4	.2	3.3	7.7	4.2	.8	16.2
SSW	86	7.4	372.8	1119.9	359.8	70.2	1930.0	.1	4.3	13.0	4.2	.8	22.4
TOTAL	3210	621.8	11834.9	26675.8	13846.2	2560.8	55539.4	.2	3.7	8.3	4.3	.8	17.3

1985 Two-Yard Directional Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	441	21.1	1341.4	3126.5	1797.7	449.4	6736.2	.0	3.0	7.1	4.1	1.0	15.3
INT-2	384	50.4	1070.2	3602.8	1564.2	412.0	6699.6	.1	2.8	9.4	4.1	1.1	17.4
INT-3	584	138.5	1569.5	5140.6	2529.1	484.5	9862.1	.2	2.7	8.8	4.3	.8	16.9
INT-4	765	261.1	2410.8	6339.1	3368.8	470.1	12849.8	.3	3.2	8.3	4.4	.6	16.8
INT-5	678	130.0	3493.9	5306.4	3025.8	403.0	12359.0	.2	5.2	7.8	4.5	.6	18.2
INT-6	358	20.7	1949.2	3160.4	1560.7	341.8	7032.8	.1	5.4	8.8	4.4	1.0	19.6
TOTAL	3210	621.8	11834.9	26675.8	13846.2	2560.8	55539.4	.2	3.7	8.3	4.3	.8	17.3

B.5 Detention Time for 2000 Two-Yard Directional Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

2000 Two-Yard Directional Gateway Yard

Inbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	517	236.7	1824.0	4701.1	2149.6	564.0	9475.3	.5	3.5	9.1	4.2	1.1	18.3
BN	102	8.5	771.8	1034.0	382.3	127.4	2323.9	.1	7.6	10.1	3.7	1.2	22.8
CNW	114	0.	324.9	702.0	423.1	145.8	1595.8	0.	2.9	6.2	3.7	1.3	14.0
ICG	114	119.7	414.2	1337.8	473.2	104.4	2449.2	1.1	3.6	11.7	4.2	.9	21.5
MKT	92	78.2	418.6	797.4	378.9	86.2	1711.2	.8	4.6	8.7	4.1	.9	18.6
MP	284	62.3	1266.1	2214.3	1147.3	291.0	4981.0	.2	4.5	7.8	4.0	1.0	17.5
MRS	43	0.	250.8	602.1	189.8	23.5	1066.2	0.	5.8	14.0	4.4	.5	24.8
NW	178	108.3	639.5	1740.3	717.0	188.6	3393.8	.6	3.6	9.8	4.0	1.1	19.1
SLSF	813	240.4	3218.6	7149.9	3248.4	937.8	14795.1	.3	4.0	8.8	4.0	1.2	18.2
SOU	366	86.3	1082.1	2485.2	1171.2	702.1	5526.9	.2	3.0	6.8	3.2	1.9	15.1
SSW	787	275.3	3047.6	6689.2	3430.3	750.6	14193.0	.3	3.9	8.5	4.4	1.0	18.0
TRRA	503	56.1	2349.6	3703.2	2080.0	496.0	8684.9	.1	4.7	7.4	4.1	1.0	17.3
TOTAL	3913	1271.7	15607.9	33156.3	15791.0	4417.2	70196.2	.3	4.0	8.5	4.0	1.1	17.9

2000 Two-Yard Directional Gateway Yard

			Aggregate Car Hours					Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	1255	335.7	4687.3	10334.0	4778.6	1811.3	21946.8	.3	3.7	8.2	3.8	1.4	17.5
BN	72	45.1	246.5	365.7	249.6	106.8	1013.6	.6	3.4	5.1	3.5	1.5	14.1
BO	439	137.2	1948.8	4222.7	1884.0	325.5	8518.2	.3	4.4	9.6	4.3	.7	19.4
CNW	251	117.6	963.5	2154.2	1051.7	160.8	4447.8	.5	3.8	8.6	4.2	.6	17.7
CR	883	299.7	3768.2	6165.7	3754.0	899.1	14886.7	.3	4.3	7.0	4.3	1.0	16.9
LN	245	106.6	842.6	2358.3	943.1	298.9	4549.5	.4	3.4	9.6	3.8	1.2	18.6
MP	128	32.4	565.5	1778.8	613.3	149.3	3139.3	.3	4.4	13.9	4.8	1.2	24.5
MRS	39	8.7	107.2	487.2	120.3	48.1	771.4	.2	2.7	12.5	3.1	1.2	19.8
NW	167	52.9	632.1	1359.8	761.1	71.9	2877.7	.3	3.8	8.1	4.6	.4	17.2
SOU	370	115.3	1644.1	3736.1	1417.8	432.3	7297.7	.3	4.4	10.1	3.8	1.2	19.7
TRRA	64	20.6	202.3	194.0	217.6	113.1	747.5	.3	3.2	3.0	3.4	1.8	11.7
TOTAL	3913	1271.7	15607.9	33156.3	15791.0	4417.2	70196.2	.3	4.0	8.5	4.0	1.1	17.9

2000 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-502	114	0.	324.9	702.0	423.1	145.8	1595.8	0.	2.9	6.2	3.7	1.3	14.0
-K01	92	78.2	418.6	797.4	378.9	86.2	1711.2	.8	4.6	8.7	4.1	.9	18.6
-S02	157	0.	492.9	926.0	470.4	333.2	2222.5	0.	3.1	5.9	3.0	2.1	14.2
-S04	135	51.8	438.8	1113.2	445.0	254.0	2302.8	.4	3.3	8.2	3.3	1.9	17.1
-S06	74	34.5	150.5	446.0	255.8	114.9	1001.6	.5	2.0	6.0	3.5	1.6	13.5
2G01	84	8.4	184.8	797.1	381.1	75.8	1447.2	.1	2.2	9.5	4.5	.9	17.2
2G03	123	0.	688.8	1130.3	540.8	89.8	2449.8	0.	5.6	9.2	4.4	.7	19.9
5G02	138	94.3	439.3	943.5	585.3	145.5	2208.0	.7	3.2	6.8	4.2	1.1	16.0
6207	78	33.8	230.1	735.4	345.1	56.6	1400.9	.4	3.0	9.4	4.4	.7	18.0
6211	114	123.5	323.0	858.8	469.3	133.9	1908.5	1.1	2.8	7.5	4.1	1.2	16.7
6213	125	0.	900.0	1394.6	523.8	136.5	2954.9	0.	7.2	11.2	4.2	1.1	23.6
6215	101	0.	252.5	702.5	376.6	132.6	1464.2	0.	2.5	7.0	3.7	1.3	14.5
6219	120	0.	334.0	901.6	439.4	193.4	1868.5	0.	2.8	7.5	3.7	1.6	15.6
6221	111	64.8	401.5	1129.3	432.9	143.5	2171.8	.6	3.6	10.2	3.9	1.3	19.6
6223	64	0.	125.9	696.6	284.1	36.7	1143.3	0.	2.0	10.9	4.4	.6	17.9
6225	100	18.3	651.7	731.1	377.2	104.8	1883.0	.2	6.5	7.3	3.8	1.0	18.8
6M01	104	13.9	578.9	511.8	390.5	121.2	1616.2	.1	5.6	4.9	3.8	1.2	15.5
7G02	64	35.2	120.5	552.3	229.5	110.6	1048.1	.6	1.9	8.6	3.6	1.7	16.4
9G03	37	33.9	165.3	310.6	141.8	34.2	685.9	.9	4.5	8.4	3.8	.9	18.5
AG16	36	25.8	174.0	782.4	121.5	64.8	1168.4	.7	4.8	21.7	3.4	1.8	32.5
CG03	66	1.1	291.5	411.6	257.1	47.7	1009.0	.0	4.4	6.2	3.9	.7	15.3
CG05	51	31.5	128.4	379.8	211.0	80.2	830.9	.6	2.5	7.4	4.1	1.6	16.3
DG03	51	48.5	265.2	506.6	218.7	43.7	1082.6	1.0	5.2	9.9	4.3	.9	21.2
DG05	81	0.	179.6	662.6	333.0	89.3	1264.4	0.	2.2	8.2	4.1	1.1	15.6
DG07	48	0.	242.4	533.4	205.1	36.8	1017.7	0.	5.1	11.1	4.3	.8	21.2
GG05	35	39.1	51.3	184.9	149.6	43.3	468.1	1.1	1.5	5.3	4.3	1.2	13.4
LG04	102	8.5	771.8	1034.0	382.3	127.4	2323.9	.1	7.6	10.1	3.7	1.2	22.8
MG02	107	16.1	312.1	700.6	420.3	152.1	1601.0	.2	2.9	6.5	3.9	1.4	15.0
MG04	112	7.5	821.3	1112.9	500.2	57.1	2498.9	.1	7.3	9.9	4.5	.5	22.3
MG06	80	0.	294.7	584.4	358.8	45.5	1283.3	0.	3.7	7.3	4.5	.6	16.0
MG08	87	0.	501.7	513.9	332.8	113.5	1461.8	0.	5.8	5.9	3.8	1.3	16.8
FG19	43	0.	250.8	602.1	189.8	23.5	1066.2	0.	5.8	14.0	4.4	.5	24.8

2000 Two-Yard Directional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours: Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Average Car Hours/Car: Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
VG03	114	119.7	414.2	1337.8	473.2	104.4	2449.2	1.1	3.6	11.7	4.2	.9	21.5
WG03	114	108.3	368.6	1241.0	468.4	135.7	2322.0	.9	3.2	10.9	4.1	1.2	20.4
WG05	64	0.	270.9	499.4	248.6	52.9	1071.8	0.	4.2	7.8	3.9	.8	16.7
XG01	93	0.	248.0	964.4	380.6	93.0	1685.9	0.	2.7	10.4	4.1	1.0	18.1
XG03	111	0.	371.9	1000.4	512.6	101.2	1985.9	0.	3.4	9.0	4.6	.9	17.9
XG05	151	0.	490.5	1201.3	655.1	146.0	2492.9	0.	3.2	8.0	4.3	1.0	16.5
XG07	89	130.5	293.7	517.2	408.5	96.3	1446.2	1.5	3.3	5.8	4.6	1.1	16.2
XG09	63	6.3	420.0	819.8	258.6	74.3	1579.1	.1	6.7	13.0	4.1	1.2	25.1
XG11	91	104.7	376.1	719.8	420.0	67.8	1688.4	1.2	4.1	7.9	4.6	.7	18.6
XG13	78	33.8	434.2	618.3	347.8	59.4	1493.5	.4	5.6	7.9	4.5	.8	19.1
XG21	30	0.	50.0	281.9	107.8	39.8	479.4	0.	1.7	9.4	3.6	1.3	16.0
XG72	81	0.	363.2	566.3	339.5	72.9	1341.8	0.	4.5	7.0	4.2	.9	16.6
TOTAL	3913	1271.7	15607.9	33156.3	15791.0	4417.2	70196.2	.3	4.0	8.5	4.0	1.1	17.9

2000 Two-Yard Directional Gateway Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
3-01	82	7.6	327.4	461.8	292.5	64.2	1153.4	.1	4.0	5.6	3.6	.8	14.1
3-03	96	49.6	318.7	1367.7	424.0	56.0	2215.9	.5	3.3	14.2	4.4	.6	23.1
5-03	44	8.3	223.2	164.0	121.0	101.9	618.3	.2	5.1	3.7	2.8	2.3	14.1
5-05	93	49.0	303.7	867.9	406.1	58.9	1685.6	.5	3.3	9.3	4.4	.6	18.1
E471	84	37.7	467.7	267.5	369.6	0.	1142.5	.4	5.6	3.2	4.4	0.	13.6
E491	61	27.5	249.2	793.0	173.9	131.2	1374.6	.5	4.1	13.0	2.9	2.2	22.5
E493	127	9.6	439.3	1027.9	637.1	14.8	2128.7	.1	3.5	8.1	5.0	.1	16.8
G204	63	12.0	252.9	650.3	203.7	111.3	1230.2	.2	4.0	10.3	3.2	1.8	19.5
G301	67	49.5	196.5	528.9	226.7	178.7	1180.2	.7	2.9	7.9	3.4	2.7	17.6
G401	128	41.2	597.1	1307.9	650.7	19.2	2616.1	.3	4.7	10.2	5.1	.2	20.4
G403	85	75.4	210.0	271.3	330.1	167.2	1054.0	.9	2.5	3.2	3.9	2.0	12.4
G491	96	19.6	460.7	1461.8	465.6	62.4	2470.0	.2	4.8	15.2	4.9	.6	25.7
G493	71	42.9	331.9	672.6	237.9	117.2	1402.4	.6	4.7	9.5	3.4	1.7	19.8
G501	114	60.3	436.6	1122.3	524.6	0.	2143.8	.5	3.8	9.8	4.6	0.	18.8
G701	89	35.7	332.2	1037.8	406.4	178.0	1990.1	.4	3.7	11.7	4.6	2.0	22.4
G902	44	0.	252.3	130.3	129.8	90.2	602.6	0.	5.7	3.0	3.0	2.1	13.7
GA08	46	0.	164.8	263.0	126.5	103.5	657.8	0.	3.6	5.7	2.8	2.3	14.3
GC03	70	23.0	234.4	300.9	236.8	113.2	908.3	.3	3.3	4.3	3.4	1.6	13.0
GC40	64	20.6	202.3	194.0	217.6	113.1	747.5	.3	3.2	3.0	3.4	1.8	11.7
GD08	50	24.3	146.3	547.4	130.8	119.2	967.9	.5	2.9	10.9	2.6	2.4	19.4
GD12	79	17.1	343.1	331.7	271.2	109.3	1072.5	.2	4.3	4.2	3.4	1.4	13.6
GG02	17	.4	61.3	244.5	49.9	35.1	391.2	.0	3.6	14.4	2.9	2.1	23.0
GL01	69	4.7	287.8	482.8	348.8	0.	1124.0	.1	4.2	7.0	5.1	0.	16.3
GL03	98	48.2	344.3	877.0	412.2	71.9	1753.6	.5	3.5	8.9	4.2	.7	17.9
GL05	72	45.1	246.5	365.7	249.6	106.8	1013.6	.6	3.4	5.1	3.5	1.5	14.1
GM01	84	46.7	257.4	711.8	410.2	12.6	1438.6	.6	3.1	8.5	4.9	.2	17.1
GM03	80	18.8	200.7	934.8	368.0	32.0	1554.4	.2	2.5	11.7	4.6	.4	19.4
GM07	36	1.4	100.2	91.7	102.6	91.8	387.6	.0	2.8	2.5	2.9	2.6	10.8
GM09	47	4.1	152.2	219.2	119.8	115.2	610.4	.1	3.2	4.7	2.6	2.5	13.0
GM11	66	0.	183.7	484.0	204.6	125.4	997.7	0.	2.8	7.3	3.1	1.9	15.1
GF02	39	8.7	107.2	487.2	120.3	48.1	771.4	.2	2.7	12.5	3.1	1.2	19.8
GR01	92	41.3	284.1	353.9	383.3	174.8	1237.5	.4	3.1	3.8	4.2	1.9	13.5

2000 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
GV02	43	15.6	175.3	499.1	106.8	108.2	905.0	.4	4.1	11.6	2.5	2.5	21.0
GV04	65	10.5	377.4	199.1	212.3	118.1	917.4	.2	5.8	3.1	3.3	1.8	14.1
GW01	108	44.9	441.2	1105.7	573.6	12.6	2177.9	.4	4.1	10.2	5.3	.1	20.2
GW03	46	15.5	146.2	529.1	118.1	134.9	943.8	.3	3.2	11.5	2.6	2.9	20.5
GX11	130	24.5	501.6	1700.1	624.0	26.0	2956.2	.2	4.5	13.1	4.8	.2	22.7
L-01	128	32.4	565.5	1778.8	613.3	149.3	3139.3	.3	4.4	13.9	4.8	1.2	24.5
R401	93	9.5	489.0	702.7	367.4	97.7	1666.3	.1	5.3	7.6	4.0	1.1	17.9
R403	79	7.7	436.7	328.8	275.2	61.9	1110.3	.1	5.5	4.2	3.5	.8	14.1
R405	105	28.2	450.5	1415.1	512.8	117.3	2523.7	.3	4.3	13.5	4.9	1.1	24.0
R407	110	82.7	405.5	626.7	636.2	25.7	1776.7	.8	3.7	5.7	5.8	.2	16.2
R409	86	43.5	412.0	525.9	299.6	107.5	1308.5	.5	4.8	6.1	3.5	1.3	16.1
R411	57	7.8	158.7	259.4	173.9	111.2	710.9	.1	2.8	4.6	3.1	2.0	12.5
R471	50	3.2	221.5	464.6	148.3	101.7	939.3	.1	4.4	9.3	3.0	2.0	18.8
RL01	90	.7	387.1	263.2	360.0	90.0	1101.0	.0	4.3	2.9	4.0	1.0	12.2
S-01	81	24.2	289.0	1062.2	294.3	140.4	1810.1	.3	3.6	13.1	3.6	1.7	22.3
S-03	52	12.1	141.0	280.1	148.2	111.8	693.2	.2	2.7	5.4	2.9	2.2	13.3
S-05	76	15.7	416.1	816.5	290.0	67.1	1605.4	.2	5.5	10.7	3.8	.9	21.1
S-81	101	27.8	524.6	474.0	498.3	0.	1524.7	.3	5.2	4.7	4.9	0.	15.1
S-83	60	35.5	273.4	1103.4	187.0	113.0	1664.4	.6	4.6	18.4	3.1	1.9	27.7
TOTAL	3913	1271.7	15607.9	33156.3	15791.0	4417.2	70196.2	.3	4.0	8.5	4.0	1.1	17.9

2000 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	141	49.7	534.3	848.4	598.4	106.8	2137.7	.4	3.8	6.0	4.2	.8	15.2
BOC	296	122.7	1117.0	1566.6	1336.8	182.0	4325.1	.4	3.8	5.3	4.5	.6	14.6
BODA	52	31.9	236.9	528.5	174.2	85.8	1057.3	.6	4.6	10.2	3.4	1.7	20.3
BOK	96	19.6	460.7	1461.8	465.6	62.4	2470.0	.2	4.8	15.2	4.9	.6	25.7
BOW	61	27.5	249.2	793.0	173.9	131.2	1374.6	.5	4.1	13.0	2.9	2.2	22.5
BOWA	19	11.0	95.0	144.1	63.7	31.4	345.1	.6	5.0	7.6	3.4	1.7	18.2
CAVE	134	43.5	436.8	494.9	454.4	226.2	1655.8	.3	3.3	3.7	3.4	1.7	12.4
CD	84	46.7	257.4	711.8	410.2	12.6	1438.6	.6	3.1	8.5	4.9	.2	17.1
CRAN	233	51.9	957.9	1048.6	833.4	308.7	3200.4	.2	4.1	4.5	3.6	1.3	13.7
CRBF	26	2.5	100.4	281.3	127.0	29.0	540.2	.1	3.9	10.8	4.9	1.1	20.8
CRC	220	82.5	881.2	1661.9	1034.0	194.0	3853.6	.4	4.0	7.6	4.7	.9	17.5
CREN	239	93.5	1063.7	1420.2	1059.7	189.2	3826.3	.4	4.5	5.9	4.4	.8	16.0
CRSE	79	25.7	350.1	1133.8	385.8	88.2	1983.5	.3	4.4	14.4	4.9	1.1	25.1
CRST	93	9.5	489.0	702.7	367.4	97.7	1666.3	.1	5.3	7.6	4.0	1.1	17.9
CWIA	27	18.6	103.2	453.0	117.9	17.1	709.7	.7	3.8	16.8	4.4	.6	26.3
CWFK	110	38.7	423.7	578.9	409.2	143.7	1594.2	.4	3.9	5.3	3.7	1.3	14.5
CWVO	114	60.3	436.6	1122.3	524.6	0.	2143.8	.5	3.8	9.8	4.6	0.	18.8
FOX	44	0.	252.3	130.3	129.8	90.2	602.6	0.	5.7	3.0	3.0	2.1	13.7
GCE	66	0.	183.7	484.0	204.6	125.4	997.7	0.	2.8	7.3	3.1	1.9	15.1
GCST	46	0.	164.8	263.0	126.5	103.5	657.8	0.	3.6	5.7	2.8	2.3	14.3
IC	108	26.2	552.6	698.2	319.1	226.3	1822.4	.2	5.1	6.5	3.0	2.1	16.9
INDY	64	4.5	213.5	463.7	169.7	150.3	1001.6	.1	3.3	7.2	2.7	2.3	15.6
ITC	89	35.7	332.2	1037.8	406.4	178.0	1990.1	.4	3.7	11.7	4.6	2.0	22.4
LNEV	96	49.6	318.7	1367.7	424.0	56.0	2215.9	.5	3.3	14.2	4.4	.6	23.1
LNNA	149	57.0	523.9	990.6	519.1	242.9	2333.6	.4	3.5	6.6	3.5	1.6	15.7
MAD	116	20.2	300.9	1026.5	470.6	123.8	1942.0	.2	2.6	8.8	4.1	1.1	16.7
MFCH	112	31.1	499.4	1530.2	522.7	130.7	2714.0	.3	4.5	13.7	4.7	1.2	24.2
MFD	129	41.4	489.5	879.1	402.1	228.5	2040.4	.3	3.8	6.8	3.1	1.8	15.8
MFVG	16	1.3	66.1	248.6	90.7	18.7	425.4	.1	4.1	15.5	5.7	1.2	26.6
MFW	63	12.0	252.9	650.3	203.7	111.3	1230.2	.2	4.0	10.3	3.2	1.8	19.5
MRS	39	8.7	107.2	487.2	120.3	48.1	771.4	.2	2.7	12.5	3.1	1.2	19.8

2000 Two-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NWBE	66	31.1	231.0	637.0	262.9	48.4	1210.4	.5	3.5	9.7	4.0	.7	18.3
NWDK	78	38.4	316.3	795.1	412.1	9.1	1570.9	.5	4.1	10.2	5.3	.1	20.1
NWDT	30	6.5	124.9	310.6	161.5	3.5	607.0	.2	4.2	10.4	5.4	.1	20.2
NWSC	32	17.1	113.3	240.0	149.3	23.5	543.2	.5	3.5	7.5	4.7	.7	17.0
NWW	46	15.5	146.2	529.1	118.1	134.9	943.8	.3	3.2	11.5	2.6	2.9	20.5
SOCG	101	27.8	524.6	474.0	498.3	0.	1524.7	.3	5.2	4.7	4.9	0.	15.1
SODA	52	12.1	141.0	280.1	148.2	111.8	693.2	.2	2.7	5.4	2.9	2.2	13.3
SOKN	47	8.0	247.4	546.1	175.5	41.5	1018.4	.2	5.3	11.6	3.7	.9	21.7
SOLO	60	35.5	273.4	1103.4	187.0	113.0	1664.4	.6	4.6	18.4	3.1	1.9	27.7
SOMA	29	7.7	168.7	270.4	114.5	25.6	587.0	.3	5.8	9.3	4.0	.9	20.2
SOFR	81	24.2	289.0	1062.2	294.3	140.4	1810.1	.3	3.6	13.1	3.6	1.7	22.3
SSW	130	24.5	581.6	1700.1	624.0	26.0	2956.2	.2	4.5	13.1	4.8	.2	22.7
TOTAL	3913	1271.7	15607.9	33156.3	15791.0	4417.2	70196.2	.3	4.0	8.5	4.0	1.1	17.9

2000 Two-Yard Directional Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	580	35.6	1948.1	3912.2	2259.4	612.2	8767.6	.1	3.4	6.7	3.9	1.1	15.1
INT-2	370	0.	1074.9	2792.0	1290.4	619.6	5776.9	0.	2.9	7.5	3.5	1.7	15.6
INT-3	723	176.2	2059.0	6237.2	2862.1	966.1	12300.6	.2	2.8	8.6	4.0	1.3	17.0
INT-4	1039	785.3	3241.1	8816.1	4469.5	1046.3	18358.2	.8	3.1	8.5	4.3	1.0	17.7
INT-5	843	256.3	5200.2	8490.2	3453.8	828.2	18180.7	.3	6.2	10.1	4.1	1.0	21.6
INT-6	358	18.3	2084.6	2908.7	1455.9	344.9	6812.3	.1	5.8	8.1	4.1	1.0	19.0
TOTAL	3913	1271.7	15607.9	33156.3	15791.0	4417.2	70196.2	.3	4.0	8.5	4.0	1.1	17.9

B.6 Detention Time for 1985 Three-Yard Directional Gateway Yard By:

- Inbound Road
- Outbound Road
- Inbound Train
- Outbound Train
- Outbound Classification
- Time of Day Interval

1985 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	334	87.3	1147.6	2991.5	1392.3	264.7	5883.4	.3	3.4	9.0	4.2	.8	17.6
BN	141	9.4	683.9	955.3	532.0	138.7	2319.2	.1	4.9	6.8	3.8	1.0	16.4
CNW	301	7.9	1124.8	2527.5	1198.1	235.0	5093.3	.0	3.7	8.4	4.0	.8	16.9
ICG	144	53.2	306.4	1059.9	660.1	73.5	2153.0	.4	2.1	7.4	4.6	.5	15.0
MKT	77	75.7	301.6	753.7	324.9	36.7	1492.5	1.0	3.9	9.8	4.2	.5	19.4
MP	436	172.9	1479.9	3791.8	1869.9	219.2	7533.7	.4	3.4	8.7	4.3	.5	17.3
MRS	27	0.	126.0	406.1	118.3	15.4	665.9	0.	4.7	15.0	4.4	.6	24.7
NW	100	6.8	248.6	1066.6	433.0	61.5	1816.3	.1	2.5	10.7	4.3	.6	18.2
NWYD	238	48.3	807.0	1956.6	1027.4	179.4	4018.7	.2	3.4	8.2	4.3	.8	16.9
SLSF	627	151.6	2200.5	5033.3	2750.4	429.4	10661.1	.2	3.6	8.0	4.4	.7	17.0
SOU	296	27.1	849.0	2408.8	1135.5	226.6	4647.0	.1	2.9	8.1	3.8	.8	15.7
SSW	521	113.5	1556.0	4919.7	2387.1	188.8	9165.0	.2	3.0	9.4	4.6	.4	17.6
TRRA	46	13.0	74.8	332.5	165.4	54.7	640.3	.3	1.6	7.2	3.6	1.2	13.9
TOTAL	3288	766.6	10993.9	28203.3	14002.1	2123.4	56089.3	.2	3.3	8.6	4.3	.6	17.1

1985 Three-Yard Directional Gateway Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	1278	247.6	4465.5	10786.1	5091.4	980.2	21570.8	.2	3.5	8.4	4.0	.8	16.9
BN	88	27.8	247.4	607.3	550.0	0.	1432.5	.3	2.8	6.9	6.3	0.	16.3
BO	295	63.2	1018.8	2549.8	1278.6	147.6	5058.0	.2	3.5	8.6	4.3	.5	17.1
CNW	270	78.4	787.6	1901.8	1313.2	91.3	4172.2	.3	2.9	7.0	4.9	.3	15.5
CR	624	155.3	2129.5	4819.8	2933.2	245.8	10283.6	.2	3.4	7.7	4.7	.4	16.5
LN	174	28.7	467.5	1519.9	657.5	159.7	2833.2	.2	2.7	8.7	3.8	.9	16.3
MP	79	22.1	320.3	1049.3	361.6	31.6	1784.8	.3	4.1	13.3	4.6	.4	22.6
MRS	53	8.7	137.0	481.7	149.6	81.3	858.3	.2	2.6	9.1	2.8	1.5	16.2
NW	123	49.1	390.7	1330.9	496.3	0.	2267.0	.4	3.2	10.8	4.0	0.	18.4
SOU	250	82.6	852.0	2751.7	992.5	270.7	4949.5	.3	3.4	11.0	4.0	1.1	19.8
TRRA	54	3.3	177.7	405.0	178.2	115.2	879.4	.1	3.3	7.5	3.3	2.1	16.3
TOTAL	3288	766.6	10993.9	28203.3	14002.1	2123.4	56089.3	.2	3.3	8.6	4.3	.6	17.1

1985 Three-Yard Directional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-502	143	0.	450.5	1514.9	585.5	93.8	2644.6	0.	3.2	10.6	4.1	.7	18.5
-K01	77	75.7	301.6	753.7	324.9	36.7	1492.5	1.0	3.9	9.8	4.2	.5	19.4
-S02	124	0.	347.2	922.1	430.2	106.6	1806.1	0.	2.8	7.4	3.5	.9	14.6
-S04	125	27.1	425.0	1260.8	505.6	74.3	2292.8	.2	3.4	10.1	4.0	.6	18.3
-S06	47	0.	76.8	225.9	199.7	45.7	548.1	0.	1.6	4.8	4.2	1.0	11.7
2G01	78	0.	260.0	689.8	373.8	20.1	1343.7	0.	3.3	8.8	4.8	.3	17.2
2G03	67	20.1	307.1	585.5	314.1	29.7	1256.6	.3	4.6	8.7	4.7	.4	18.8
5G02	158	7.9	674.3	1012.6	612.6	141.2	2448.6	.1	4.3	6.4	3.9	.9	15.5
6207	44	0.	99.0	577.6	165.9	29.0	871.5	0.	2.3	13.1	3.8	.7	19.8
6211	91	75.8	364.0	843.6	420.3	70.0	1773.8	.8	4.0	9.3	4.6	.8	19.5
6213	82	13.7	446.9	679.4	350.3	55.4	1545.7	.2	5.4	8.3	4.3	.7	18.9
6215	95	0.	310.3	1331.3	412.5	130.7	2184.8	0.	3.3	14.0	4.3	1.4	23.0
6219	74	0.	198.6	392.7	261.1	53.7	906.0	0.	2.7	5.3	3.5	.7	12.2
6221	96	8.0	273.6	856.9	492.3	18.1	1648.8	.1	2.9	8.9	5.1	.2	17.2
6223	37	1.9	56.1	69.1	140.3	3.2	270.6	.1	1.5	1.9	3.8	.1	7.3
6225	108	52.2	540.0	282.8	515.6	69.4	1459.9	.5	5.0	2.6	4.8	.6	13.5
6N01	87	11.6	410.4	774.4	408.2	12.2	1616.7	.1	4.7	8.9	4.7	.1	18.6
7G02	90	13.5	205.5	688.6	328.5	80.0	1316.1	.2	2.3	7.7	3.6	.9	14.6
9G03	24	21.2	92.4	259.4	80.7	22.7	476.3	.9	3.9	10.8	3.4	.9	19.8
AG16	37	26.5	158.5	473.6	142.8	63.9	865.3	.7	4.3	12.8	3.9	1.7	23.4
CG03	23	6.1	35.3	248.6	92.3	18.5	400.9	.3	1.5	10.8	4.0	.8	17.4
GG03	19	0.	69.7	56.4	81.4	24.3	231.8	0.	3.7	3.0	4.3	1.3	12.2
GG05	19	6.0	54.5	238.2	71.0	23.9	393.6	.3	2.9	12.5	3.7	1.3	20.7
LG04	141	9.4	683.9	955.3	532.0	138.7	2319.2	.1	4.9	6.8	3.8	1.0	16.4
MG02	23	6.9	39.5	83.8	73.0	36.2	239.4	.3	1.7	3.6	3.2	1.6	10.4
NG01	69	0.	196.7	469.7	302.1	25.3	993.7	0.	2.9	6.8	4.4	.4	14.4
NG03	50	48.3	201.7	397.4	222.6	46.6	916.6	1.0	4.0	7.9	4.5	.9	18.3
NG05	57	0.	265.1	461.7	230.0	45.9	1002.6	0.	4.7	8.1	4.0	.8	17.6
NG07	62	0.	143.6	627.8	272.8	61.7	1105.9	0.	2.3	10.1	4.4	1.0	17.8
FG19	27	0.	126.0	406.1	118.3	15.4	665.9	0.	4.7	15.0	4.4	.6	24.7
VG01	50	24.2	145.0	404.5	213.7	27.5	814.9	.5	2.9	8.1	4.3	.5	16.3
VG03	47	29.0	84.6	143.1	233.5	23.2	513.4	.6	1.8	3.0	5.0	.5	10.9
VG05	47	0.	76.8	512.3	212.8	22.8	824.6	0.	1.6	10.9	4.5	.5	17.5

1985 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
WG02	73	0.	208.1	880.5	315.5	37.7	1441.7	0.	2.9	12.1	4.3	.5	19.7
WG04	27	6.8	40.5	186.1	117.5	23.8	374.6	.3	1.5	6.9	4.4	.9	13.9
XD01	93	80.6	251.1	895.2	373.4	57.8	1658.1	.9	2.7	9.6	4.0	.6	17.8
XD05	29	37.2	47.4	372.4	124.5	.2	581.6	1.3	1.6	12.8	4.3	.0	20.1
XD07	95	0.	243.8	787.6	414.0	85.8	1531.2	0.	2.6	8.3	4.4	.9	16.1
XD09	43	40.1	139.0	354.3	170.6	11.5	715.6	.9	3.2	8.2	4.0	.3	16.6
XD13	29	3.4	152.3	182.7	132.9	14.6	485.9	.1	5.3	6.3	4.6	.5	16.8
XD15	60	0.	236.0	425.2	246.4	37.1	944.7	0.	3.9	7.1	4.1	.6	15.7
XG01	113	11.3	322.1	1334.4	504.6	61.9	2234.2	.1	2.9	11.8	4.5	.5	19.8
XG03	100	0.	256.7	750.3	437.8	28.6	1473.4	0.	2.6	7.5	4.4	.3	14.7
XG05	92	0.	214.7	723.7	433.2	34.8	1406.3	0.	2.3	7.9	4.7	.4	15.3
XG07	51	23.0	102.8	647.0	233.0	11.4	1017.3	.5	2.0	12.7	4.6	.2	19.9
XG09	45	0.	241.5	345.8	206.3	29.3	822.8	0.	5.4	7.7	4.6	.7	18.3
XG11	71	58.0	182.2	767.0	352.4	14.4	1374.0	.8	2.6	10.8	5.0	.2	19.4
XG13	49	21.2	236.0	351.5	219.9	8.5	837.1	.4	4.8	7.2	4.5	.2	17.1
TOTAL	3288	766.6	10993.9	28203.3	14002.1	2123.4	56089.3	.2	3.3	8.6	4.3	.6	17.1

1985 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
3-01	66	12.8	190.0	591.8	258.5	71.5	1124.6	.2	2.9	9.0	3.9	1.1	17.0
3-03	36	7.7	77.8	259.3	96.6	67.8	509.1	.2	2.2	7.2	2.7	1.9	14.1
5-03	89	19.7	265.8	485.8	400.3	47.5	1219.1	.2	3.0	5.5	4.5	.5	13.7
5-05	94	34.0	263.4	343.5	477.8	43.9	1162.5	.4	2.8	3.7	5.1	.5	12.4
E491	71	22.2	240.3	946.4	321.0	0.	1530.0	.3	3.4	13.3	4.5	0.	21.5
E493	90	8.0	237.7	659.7	420.0	19.5	1345.0	.1	2.6	7.3	4.7	.2	14.9
G202	56	24.1	198.8	256.6	214.7	27.1	721.2	.4	3.5	4.6	3.8	.5	12.9
G204	34	7.3	113.4	189.0	111.1	30.6	451.3	.2	3.3	5.6	3.3	.9	13.3
G301	72	8.2	199.7	668.8	302.4	20.4	1199.5	.1	2.8	9.3	4.2	.3	16.7
G401	75	6.6	196.3	620.4	396.3	11.3	1230.8	.1	2.6	8.3	5.3	.2	16.4
G403	48	20.8	178.9	613.2	166.4	69.6	1049.0	.4	3.7	12.8	3.5	1.5	21.9
G491	66	24.0	299.0	205.0	249.7	0.	777.6	.4	4.5	3.1	3.8	0.	11.8
G493	68	9.0	241.8	738.7	287.9	128.1	1405.4	.1	3.6	10.9	4.2	1.9	20.7
G501	87	24.7	258.5	1072.5	435.0	0.	1790.7	.3	3.0	12.3	5.0	0.	20.6
G703	58	11.6	194.8	602.3	214.6	0.	1023.2	.2	3.4	10.4	3.7	0.	17.6
G902	101	21.3	385.4	1436.5	500.0	156.6	2499.6	.2	3.8	14.2	4.9	1.6	24.7
G904	20	0.	56.0	78.7	56.7	41.3	232.7	0.	2.8	3.9	2.8	2.1	11.6
GG10	31	10.9	126.7	216.8	80.1	54.3	488.7	.4	4.1	7.0	2.6	1.8	15.8
GL01	72	33.3	209.1	815.1	287.2	0.	1344.7	.5	2.9	11.3	4.0	0.	18.7
GL03	51	15.8	181.6	515.9	209.1	0.	922.3	.3	3.6	10.1	4.1	0.	18.1
GL05	88	27.8	247.4	607.3	550.0	0.	1432.5	.3	2.8	6.9	6.3	0.	16.3
GL07	54	3.3	177.7	405.0	178.2	115.2	879.4	.1	3.3	7.5	3.3	2.1	16.3
GM01	40	33.0	113.5	462.4	162.7	0.	771.6	.8	2.8	11.6	4.1	0.	19.3
GM03	55	6.6	182.8	745.4	202.6	72.4	1209.8	.1	3.3	13.6	3.7	1.3	22.0
GM05	57	22.3	190.9	721.7	201.4	38.0	1174.3	.4	3.3	12.7	3.5	.7	20.6
GM07	41	0.	131.6	141.7	127.1	77.9	478.3	0.	3.2	3.5	3.1	1.9	11.7
GM09	42	0.	115.5	323.0	121.1	4.2	563.8	0.	2.8	7.7	2.9	.1	13.4
GN01	43	11.2	200.3	174.2	124.7	81.0	591.3	.3	4.7	4.1	2.9	1.9	13.8
GN03	31	7.5	72.6	109.7	141.1	50.1	381.0	.2	2.3	3.5	4.6	1.6	12.3
GN05	50	0.	140.9	81.2	175.8	67.5	465.5	0.	2.8	1.6	3.5	1.4	9.3
GN07	61	4.3	142.3	81.6	222.7	0.	450.8	.1	2.3	1.3	3.7	0.	7.4
GN09	51	6.8	124.6	288.5	184.5	36.6	640.9	.1	2.4	5.7	3.6	.7	12.6
GN11	34	2.5	148.3	54.0	89.5	80.5	374.8	.1	4.4	1.6	2.6	2.4	11.0

1985 Three-Yard Directional Gateway Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
GF02	36	5.8	89.6	422.0	96.0	51.0	664.4	.2	2.5	11.7	2.7	1.4	18.5
GF06	17	2.9	47.4	59.7	53.6	30.3	193.9	.2	2.8	3.5	3.2	1.8	11.4
GR45	109	38.5	462.5	618.2	630.4	0.	1749.6	.4	4.2	5.7	5.8	0.	16.1
GS01	79	1.9	270.6	1268.1	331.8	0.	1872.5	.0	3.4	16.1	4.2	0.	23.7
GV02	88	9.5	367.4	932.1	428.3	0.	1737.2	.1	4.2	10.6	4.9	0.	19.7
GV04	61	11.3	248.6	258.9	249.1	0.	767.9	.2	4.1	4.2	4.1	0.	12.6
GW03	34	7.4	113.7	465.0	129.3	44.8	760.1	.2	3.3	13.7	3.8	1.3	22.4
GW05	20	4.8	61.6	217.9	44.0	56.0	384.3	.2	3.1	10.9	2.2	2.8	19.2
GX02	82	5.1	302.7	1062.9	348.5	61.5	1780.7	.1	3.7	13.0	4.3	.8	21.7
L-01	79	22.1	320.3	1049.3	361.6	31.6	1784.8	.3	4.1	13.3	4.6	.4	22.6
R401	73	18.0	242.5	1144.2	351.7	53.5	1809.9	.2	3.3	15.7	4.8	.7	24.8
R403	41	13.1	182.3	186.1	133.9	110.0	625.5	.3	4.4	4.5	3.3	2.7	15.3
R405	71	31.0	237.2	383.6	317.1	0.	968.9	.4	3.3	5.4	4.5	0.	13.6
R407	57	14.6	215.1	524.8	251.8	0.	1006.3	.3	3.8	9.2	4.4	0.	17.7
R409	84	20.9	399.9	241.7	443.8	1.4	1107.7	.2	4.8	2.9	5.3	.0	13.2
R411	110	19.0	309.1	863.5	630.7	0.	1822.3	.2	2.8	7.9	5.7	0.	16.6
R471	65	11.4	168.1	242.3	241.6	0.	663.3	.2	2.6	3.7	3.7	0.	10.2
S-01	81	23.8	277.3	537.4	376.7	29.7	1244.8	.3	3.4	6.6	4.6	.4	15.4
S-03	26	5.3	102.9	410.8	63.7	35.1	617.8	.2	4.0	15.8	2.5	1.4	23.8
S-05	69	36.8	246.0	847.7	300.2	102.3	1533.0	.5	3.6	12.3	4.4	1.5	22.2
S-81	29	2.4	79.6	400.2	78.8	6.8	567.7	.1	2.7	13.8	2.7	.2	19.6
S-83	45	14.3	146.3	555.6	173.3	96.8	986.2	.3	3.3	12.3	3.9	2.2	21.9
TOTAL	3288	766.6	10993.9	28203.3	14002.1	2123.4	56089.3	.2	3.3	8.6	4.3	.6	17.1

1985 Three-Yard Directional Gateway Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	142	31.1	425.1	1012.3	728.2	115.2	2311.8	.2	3.0	7.1	5.1	.8	16.3
BOC	156	32.0	536.7	864.7	669.7	19.5	2122.6	.2	3.4	5.5	4.3	.1	13.6
BODA	48	20.8	178.9	613.2	166.4	69.6	1049.0	.4	3.7	12.8	3.5	1.5	21.9
BOK	68	9.0	241.8	738.7	287.9	128.1	1405.4	.1	3.6	10.9	4.2	1.9	20.7
BOW	51	15.5	161.3	636.8	255.0	0.	1068.6	.3	3.2	12.5	5.0	0.	21.0
BOWA	20	6.8	79.0	309.6	66.0	0.	461.4	.3	4.0	15.5	3.3	0.	23.1
CAVE	42	0.	115.5	323.0	121.1	4.2	563.8	0.	2.8	7.7	2.9	.1	13.4
CRAN	194	39.9	709.0	1105.2	1074.5	1.4	2929.9	.2	3.7	5.7	5.5	.0	15.1
CRBF	19	3.0	57.1	364.4	76.3	13.9	514.7	.2	3.0	19.2	4.0	.7	27.1
CRC	184	45.1	658.8	1238.6	1026.6	11.3	2980.4	.2	3.6	6.7	5.6	.1	16.2
CREN	177	55.5	587.6	812.1	692.6	110.0	2257.7	.3	3.3	4.6	3.9	.6	12.8
CRSE	54	15.0	185.4	779.8	275.4	39.6	1295.2	.3	3.4	14.4	5.1	.7	24.0
CRST	57	14.6	215.1	524.8	251.8	0.	1006.3	.3	3.8	9.2	4.4	0.	17.7
CWIA	18	6.0	47.9	134.5	67.8	9.6	265.7	.3	2.7	7.5	3.8	.5	14.8
CWPK	165	47.7	481.3	694.8	810.4	81.7	2115.8	.3	2.9	4.2	4.9	.5	12.8
CWVO	87	24.7	258.5	1072.5	435.0	0.	1790.7	.3	3.0	12.3	5.0	0.	20.6
GCE	40	33.0	113.5	462.4	162.7	0.	771.6	.8	2.8	11.6	4.1	0.	19.3
GCW	57	22.3	190.9	721.7	201.4	38.0	1174.3	.4	3.3	12.7	3.5	.7	20.6
IC	149	20.8	616.0	1191.0	677.4	0.	2505.0	.1	4.1	8.0	4.5	0.	16.8
INDY	121	21.3	441.4	1515.1	556.6	197.9	2732.3	.2	3.6	12.5	4.6	1.6	22.6
ITC	58	11.6	194.8	602.3	214.6	0.	1023.2	.2	3.4	10.4	3.7	0.	17.6
LNEV	72	8.2	199.7	668.8	302.4	20.4	1199.5	.1	2.8	9.3	4.2	.3	16.7
LNNA	102	20.5	267.7	851.1	355.1	139.3	1633.7	.2	2.6	8.3	3.5	1.4	16.0
MAD	41	0.	131.6	141.7	127.1	77.9	478.3	0.	3.2	3.5	3.1	1.9	11.7
MFCH	68	18.0	280.8	879.5	319.6	27.2	1525.1	.3	4.1	12.9	4.7	.4	22.4
MFD	31	10.9	126.7	216.8	80.1	54.3	488.7	.4	4.1	7.0	2.6	1.8	15.8
MFVG	11	4.1	39.5	169.8	42.0	4.4	259.7	.4	3.6	15.4	3.8	.4	23.6
MFW	90	31.4	312.1	445.5	325.7	57.7	1172.5	.3	3.5	5.0	3.6	.6	13.0
MRS	53	8.7	137.0	481.7	149.6	81.3	858.3	.2	2.6	9.1	2.8	1.5	16.2
NWBE	49	18.3	139.9	497.7	214.8	0.	870.6	.4	2.9	10.2	4.4	0.	17.8
NWCH	11	1.3	32.7	136.7	35.8	14.5	220.9	.1	3.0	12.4	3.3	1.3	20.1
NWDK	51	15.8	181.6	515.9	209.1	0.	922.3	.3	3.6	10.1	4.1	0.	18.1
NWDT	23	6.1	81.0	328.4	93.5	30.3	539.3	.3	3.5	14.3	4.1	1.3	23.4

1985 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NWSC	23	15.0	69.2	317.4	72.5	0.	474.1	.7	3.0	13.8	3.2	0.	20.6
NWW	20	4.8	61.6	217.9	44.0	56.0	384.3	.2	3.1	10.9	2.2	2.8	19.2
NWYD	270	32.2	829.1	789.1	938.2	315.6	2904.2	.1	3.1	2.9	3.5	1.2	10.8
SOCG	81	23.8	277.3	537.4	376.7	29.7	1244.8	.3	3.4	6.6	4.6	.4	15.4
SODA	29	2.4	79.6	400.2	78.8	6.8	567.7	.1	2.7	13.8	2.7	.2	19.6
SOKN	79	1.9	270.6	1268.1	331.8	0.	1872.5	.0	3.4	16.1	4.2	0.	23.7
SOLO	45	14.3	146.3	555.6	173.3	96.8	986.2	.3	3.3	12.3	3.9	2.2	21.9
SOMA	26	5.3	102.9	410.8	63.7	35.1	617.8	.2	4.0	15.8	2.5	1.4	23.8
SOFR	69	36.8	246.0	847.7	300.2	102.3	1533.0	.5	3.6	12.3	4.4	1.5	22.2
SSW	82	5.1	302.7	1062.9	348.5	61.5	1780.7	.1	3.7	13.0	4.3	.8	21.7
WFE	55	6.6	182.8	745.4	202.6	72.4	1209.8	.1	3.3	13.6	3.7	1.3	22.0
TOTAL	3288	766.6	10993.9	28203.3	14002.1	2123.4	56089.3	.2	3.3	8.6	4.3	.6	17.1

1985 Three-Yard Directional Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours: Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Average Car Hours/Car: Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	444	12.9	1133.7	4646.9	1893.1	397.0	8083.5	.0	2.6	10.5	4.3	.9	18.2
INT-2	483	153.3	1311.3	4321.3	1907.5	307.5	8000.9	.3	2.7	8.9	3.9	.6	16.6
INT-3	581	55.5	1656.9	4799.9	2513.2	282.4	9307.9	.1	2.9	8.3	4.3	.5	16.0
INT-4	778	201.5	2284.2	6690.1	3391.7	474.6	13042.0	.3	2.9	8.6	4.4	.6	16.8
INT-5	751	271.2	3426.0	6358.8	3155.6	492.7	13704.3	.4	4.6	8.5	4.2	.7	18.2
INT-6	251	72.3	1181.8	1386.4	1141.0	169.3	3950.8	.3	4.7	5.5	4.5	.7	15.7
TOTAL	3288	766.6	10993.9	28203.3	14002.1	2123.4	56089.3	.2	3.3	8.6	4.3	.6	17.1

B.7 Detention Time for 2000 Three-Yard Directional Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

2000 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	604	124.7	2573.0	5188.0	2417.5	581.3	10884.5	.2	4.3	8.6	4.0	1.0	18.0
BN	102	0.	489.6	901.4	422.6	86.0	1899.7	0.	4.8	8.8	4.1	.8	18.6
CNW	114	0.	302.1	708.7	480.0	86.1	1576.9	0.	2.7	6.2	4.2	.8	13.8
ICG	204	53.0	554.1	1517.7	866.1	161.9	3152.7	.3	2.7	7.4	4.2	.8	15.5
MKT	92	42.9	377.2	814.9	375.9	98.1	1709.0	.5	4.1	8.9	4.1	1.1	18.6
MP	438	250.7	1523.5	4396.8	1748.6	418.8	8338.5	.6	3.5	10.0	4.0	1.0	19.0
MRS	45	0.	201.8	694.7	217.3	11.6	1125.4	0.	4.5	15.4	4.8	.3	25.0
NW	151	42.9	480.5	1114.4	698.1	66.5	2402.5	.3	3.2	7.4	4.6	.4	15.9
NWYD	323	65.3	1130.5	2704.5	1337.9	278.3	5516.4	.2	3.5	8.4	4.1	.9	17.1
SLSF	830	207.6	3040.3	8660.3	3427.1	724.5	16059.0	.3	3.7	10.4	4.1	.9	19.3
SOU	364	33.3	1191.8	3117.4	1358.0	399.8	6100.2	.1	3.3	8.6	3.7	1.1	16.8
SSW	830	89.9	3452.1	6984.8	3502.4	656.0	14685.2	.1	4.2	8.4	4.2	.8	17.7
TRRA	75	19.8	133.0	613.6	311.5	56.7	1134.6	.3	1.8	8.2	4.2	.8	15.1
TOTAL	4172	930.1	15449.5	37417.1	17163.0	3625.5	74585.1	.2	3.7	9.0	4.1	.9	17.9

2000 Three-Yard Directional Gateway Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	1490	329.7	5323.3	13078.3	5675.1	1564.9	25971.3	.2	3.6	8.8	3.8	1.1	17.4
BN	108	18.5	328.7	952.8	534.6	59.4	1894.0	.2	3.0	8.8	4.9	.5	17.5
BO	400	78.9	1611.0	3426.8	1777.9	241.6	7136.2	.2	4.0	8.6	4.4	.6	17.8
CNW	329	73.2	1130.8	2876.2	1515.0	148.2	5743.3	.2	3.4	8.7	4.6	.5	17.5
CR	811	179.1	3354.5	6480.3	3464.0	712.5	14190.3	.2	4.1	8.0	4.3	.9	17.5
LN	243	53.7	753.3	1932.3	1065.0	105.2	3909.5	.2	3.1	8.0	4.4	.4	16.1
MP	119	34.5	540.0	1412.2	574.2	0.	2560.9	.3	4.5	11.9	4.8	0.	21.5
MRS	64	11.9	210.1	464.7	178.7	116.7	982.0	.2	3.3	7.3	2.8	1.8	15.3
NW	175	47.6	642.5	2244.3	688.4	159.3	3782.1	.3	3.7	12.8	3.9	.9	21.6
SOU	339	83.0	1162.7	3754.2	1301.8	439.3	6740.9	.2	3.4	11.1	3.8	1.3	19.9
TRRA	94	20.2	392.6	795.1	388.5	78.3	1674.8	.2	4.2	8.5	4.1	.8	17.8
TOTAL	4172	930.1	15449.5	37417.1	17163.0	3625.5	74585.1	.2	3.7	9.0	4.1	.9	17.9

2000 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-502	114	0.	302.1	708.7	480.0	86.1	1576.9	0.	2.7	6.2	4.2	.8	13.8
-K01	92	42.9	377.2	814.9	375.9	98.1	1709.0	.5	4.1	8.9	4.1	1.1	18.6
-S02	157	0.	511.3	1149.7	586.4	137.6	2385.0	0.	3.3	7.3	3.7	.9	15.2
-S04	133	33.3	472.2	1400.6	490.2	173.3	2569.4	.3	3.6	10.5	3.7	1.3	19.3
-S06	74	0.	208.4	567.1	281.4	88.8	1145.8	0.	2.8	7.7	3.8	1.2	15.5
2G01	91	0.	324.6	728.7	404.6	73.1	1531.0	0.	3.6	8.0	4.4	.8	16.8
2G03	98	34.3	524.3	980.8	441.5	35.0	2015.8	.3	5.3	10.0	4.5	.4	20.6
5G02	137	29.7	596.0	1112.1	498.7	187.8	2424.2	.2	4.4	8.1	3.6	1.4	17.7
6207	78	33.8	170.3	966.3	262.5	129.4	1562.3	.4	2.2	12.4	3.4	1.7	20.0
6211	112	48.5	431.2	1289.9	483.2	96.6	2349.4	.4	3.9	11.5	4.3	.9	21.0
6213	132	55.0	792.0	1666.0	593.1	74.5	3180.6	.4	6.0	12.6	4.5	.6	24.1
6215	101	1.7	260.9	774.6	390.3	120.0	1547.5	.0	2.6	7.7	3.9	1.2	15.3
6219	120	0.	334.0	1507.5	481.5	99.4	2422.3	0.	2.8	12.6	4.0	.8	20.2
6221	123	10.3	356.7	1108.0	564.8	79.7	2119.5	.1	2.9	9.0	4.6	.6	17.2
6223	64	0.	130.1	227.2	229.6	63.1	650.0	0.	2.0	3.6	3.6	1.0	10.2
6225	100	58.3	565.0	1120.9	422.2	61.8	2228.2	.6	5.7	11.2	4.2	.6	22.3
6M01	104	15.6	487.1	906.8	516.1	18.8	1944.3	.2	4.7	8.7	5.0	.2	18.7
7G02	125	20.8	520.8	570.9	485.6	109.6	1707.8	.2	4.2	4.6	3.9	.9	13.7
9G03	37	19.1	138.1	399.4	140.9	38.7	736.1	.5	3.7	10.8	3.8	1.0	19.9
AG16	53	11.5	282.7	725.6	184.7	72.4	1276.9	.2	5.3	13.7	3.5	1.4	24.1
CG03	40	9.3	60.7	498.8	190.6	3.3	762.7	.2	1.5	12.5	4.8	.1	19.1
GG03	26	0.	114.4	282.3	119.2	10.9	526.8	0.	4.4	10.9	4.6	.4	20.3
GG05	37	9.3	72.2	388.3	142.4	53.8	666.0	.3	2.0	10.5	3.8	1.5	18.0
LG04	102	0.	489.6	901.4	422.6	86.0	1899.7	0.	4.8	8.8	4.1	.8	18.6
MG02	35	10.5	72.3	114.8	120.9	53.4	371.9	.3	2.1	3.3	3.5	1.5	10.6
NG01	67	0.	148.5	502.6	259.0	66.2	976.3	0.	2.2	7.5	3.9	1.0	14.6
NG03	77	46.2	204.1	748.6	333.1	68.9	1400.8	.6	2.7	9.7	4.3	.9	18.2
NG05	91	0.	462.6	706.1	355.3	103.3	1627.4	0.	5.1	7.8	3.9	1.1	17.9
NG07	88	19.1	315.3	747.2	390.5	39.8	1511.9	.2	3.6	8.5	4.4	.5	17.2
FG19	45	0.	201.8	694.7	217.3	11.6	1125.4	0.	4.5	15.4	4.8	.3	25.0
VG01	74	40.7	182.5	573.3	333.2	47.8	1177.5	.6	2.5	7.7	4.5	.6	15.9
VG03	67	12.3	208.8	272.9	241.9	96.9	832.8	.2	3.1	4.1	3.6	1.4	12.4
VG05	63	0.	162.8	671.5	291.0	17.2	1142.4	0.	2.6	10.7	4.6	.3	18.1

2000 Three-Yard Directional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
WG02	112	42.9	360.3	785.0	524.0	46.7	1758.9	.4	3.2	7.0	4.7	.4	15.7
WG04	39	0.	120.3	329.4	174.2	19.8	643.6	0.	3.1	8.4	4.5	.5	16.5
XD01	100	96.7	333.3	1249.1	353.0	133.0	2165.1	1.0	3.3	12.5	3.5	1.3	21.7
XD05	59	75.7	113.1	835.1	220.6	57.4	1301.9	1.3	1.9	14.2	3.7	1.0	22.1
XD07	76	31.7	195.1	646.7	295.0	88.8	1257.2	.4	2.6	8.5	3.9	1.2	16.5
XD09	34	14.7	109.9	249.5	115.1	46.8	536.0	.4	3.2	7.3	3.4	1.4	15.8
XD13	19	7.9	110.2	191.2	80.4	14.9	404.6	.4	5.8	10.1	4.2	.8	21.3
XD15	46	8.4	174.8	318.5	168.5	59.2	729.4	.2	3.8	6.9	3.7	1.3	15.9
XG01	93	0.	248.0	629.0	386.1	63.5	1326.7	0.	2.7	6.8	4.2	.7	14.3
XG03	154	0.	569.8	1092.4	554.9	163.4	2380.4	0.	3.7	7.1	3.6	1.1	15.5
XG05	151	0.	514.8	1189.4	619.9	159.0	2483.0	0.	3.4	7.9	4.1	1.1	16.4
XG07	90	37.5	238.5	960.1	403.4	69.2	1708.6	.4	2.7	10.7	4.5	.8	19.0
XG09	67	0.	362.9	587.7	304.1	55.9	1310.6	0.	5.4	8.8	4.5	.8	19.6
XG11	110	44.0	583.0	1075.6	485.8	83.3	2271.7	.4	5.3	9.8	4.4	.8	20.7
XG13	84	8.4	555.8	604.8	390.3	26.3	1585.6	.1	6.6	7.2	4.6	.3	18.9
XG72	81	0.	379.4	845.8	358.1	35.5	1618.7	0.	4.7	10.4	4.4	.4	20.0
TOTAL	4172	930.1	15449.5	37417.1	17163.0	3625.5	74585.1	.2	3.7	9.0	4.1	.9	17.9

2000 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
3-01	103	16.5	315.6	946.2	509.9	5.2	1793.3	.2	3.1	9.2	4.9	.0	17.4
3-03	44	11.1	131.6	144.8	132.7	87.3	507.5	.3	3.0	3.3	3.0	2.0	11.5
5-03	126	28.6	426.9	1270.5	658.8	0.	2384.8	.2	3.4	10.1	5.2	0.	18.9
5-05	76	14.7	265.2	99.4	244.5	135.5	759.4	.2	3.5	1.3	3.2	1.8	10.0
E491	97	25.6	403.1	1328.9	406.0	0.	2163.5	.3	4.2	13.7	4.2	0.	22.3
E493	113	14.4	386.3	758.1	514.1	1.9	1674.8	.1	3.4	6.7	4.5	.0	14.8
G202	53	14.3	191.0	284.2	153.7	111.3	754.5	.3	3.6	5.4	2.9	2.1	14.2
G204	44	6.5	160.3	308.9	144.5	21.3	641.4	.1	3.6	7.0	3.3	.5	14.6
G301	96	26.2	306.1	841.3	422.4	12.8	1608.8	.3	3.2	8.8	4.4	.1	16.8
G401	64	4.4	190.5	137.3	205.9	116.3	654.4	.1	3.0	2.1	3.2	1.8	10.2
G403	74	26.1	258.6	967.6	246.7	119.6	1618.6	.4	3.5	13.1	3.3	1.6	21.9
G491	96	26.5	435.5	474.6	486.4	0.	1422.9	.3	4.5	4.9	5.1	0.	14.8
G493	94	12.5	386.1	865.3	371.3	239.7	1874.9	.1	4.1	9.2	4.0	2.6	19.9
G501	127	29.9	438.6	1506.3	611.7	12.7	2599.2	.2	3.5	11.9	4.8	.1	20.5
G703	89	15.5	330.5	841.6	455.4	0.	1642.9	.2	3.7	9.5	5.1	0.	18.5
G902	26	7.1	104.5	292.5	58.1	71.9	534.0	.3	4.0	11.3	2.2	2.8	20.5
G904	32	0.	102.8	118.6	99.7	51.2	372.3	0.	3.2	3.7	3.1	1.6	11.6
GG10	27	26.1	90.0	389.7	65.7	69.3	640.8	1.0	3.3	14.4	2.4	2.6	23.7
GL01	96	23.9	344.7	1286.3	392.1	0.	2047.0	.2	3.6	13.4	4.1	0.	21.3
GL03	79	23.7	297.8	958.0	296.3	159.3	1735.1	.3	3.8	12.1	3.8	2.0	22.0
GL05	108	18.5	328.7	952.8	534.6	59.4	1894.0	.2	3.0	8.8	4.9	.5	17.5
GL07	94	20.2	392.6	795.1	388.5	78.3	1674.8	.2	4.2	8.5	4.1	.8	17.8
GM01	72	85.8	167.8	1057.0	261.6	70.8	1642.9	1.2	2.3	14.7	3.6	1.0	22.8
GM03	70	11.1	221.9	1044.0	226.3	123.7	1627.0	.2	3.2	14.9	3.2	1.8	23.2
GM05	69	30.8	200.5	920.4	218.5	132.3	1502.4	.4	2.9	13.3	3.2	1.9	21.8
GM07	67	.6	175.2	274.1	223.3	112.8	786.0	.0	2.6	4.1	3.3	1.7	11.7
GM09	77	0.	251.9	530.1	314.4	0.	1096.5	0.	3.3	6.9	4.1	0.	14.2
GN01	48	6.5	233.2	181.8	123.2	116.8	661.6	.1	4.9	3.8	2.6	2.4	13.8
GN03	56	1.4	159.5	371.0	166.1	116.7	814.6	.0	2.8	6.6	3.0	2.1	14.5
GN05	60	0.	162.8	729.8	237.0	63.0	1192.6	0.	2.7	12.2	4.0	1.1	19.9
GN07	83	16.1	320.7	121.6	355.5	38.7	852.7	.2	3.9	1.5	4.3	.5	10.3
GN09	63	4.8	133.6	108.9	221.6	67.2	536.0	.1	2.1	1.7	3.5	1.1	8.5
GN11	57	12.8	242.4	94.8	168.2	116.8	635.0	.2	4.3	1.7	3.0	2.1	11.1
GF02	37	8.1	138.2	375.8	85.1	77.1	684.3	.2	3.7	10.2	2.3	2.1	18.5
GF06	27	3.8	71.9	88.9	93.6	39.6	297.7	.1	2.7	3.3	3.5	1.5	11.0

2000 Three-Yard Directional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
GR45	146	36.4	640.5	1015.0	754.3	0.	2446.3	.2	4.4	7.0	5.2	0.	16.8
GS01	32	.3	147.1	191.2	126.4	12.8	477.9	.0	4.6	6.0	4.0	.4	14.9
GV02	90	16.8	416.1	1176.3	439.5	0.	2048.7	.2	4.6	13.1	4.9	0.	22.8
GV04	19	7.1	68.8	38.0	40.2	40.2	194.3	.4	3.6	2.0	2.1	2.1	10.2
GW03	52	11.9	192.5	705.1	150.8	109.2	1169.5	.2	3.7	13.6	2.9	2.1	22.5
GW05	29	7.0	95.8	297.9	64.8	80.2	545.7	.2	3.3	10.3	2.2	2.8	18.8
GX02	129	11.1	514.3	1985.5	606.3	38.7	3156.0	.1	4.0	15.4	4.7	.3	24.5
L-01	119	34.5	540.0	1412.2	574.2	0.	2560.9	.3	4.5	11.9	4.8	0.	21.5
R401	106	22.4	487.5	1228.0	394.0	129.0	2260.9	.2	4.6	11.6	3.7	1.2	21.3
R403	110	32.7	583.8	578.0	456.5	93.5	1744.5	.3	5.3	5.3	4.2	.8	15.9
R405	104	35.8	370.9	530.0	443.7	180.3	1560.7	.3	3.6	5.1	4.3	1.7	15.0
R407	90	24.2	442.7	1618.4	411.0	0.	2496.4	.3	4.9	18.0	4.6	0.	27.7
R409	95	24.8	434.7	448.7	590.6	0.	1498.7	.3	4.6	4.7	6.2	0.	15.8
R411	130	8.6	445.3	939.4	621.8	8.7	2023.8	.1	3.4	7.2	4.8	.1	15.6
R471	38	0.	140.6	32.9	93.7	65.2	332.5	0.	3.7	.9	2.5	1.7	8.8
S-01	94	27.1	275.4	553.4	454.3	105.0	1415.1	.3	2.9	5.9	4.8	1.1	15.1
S-03	32	4.7	135.9	394.9	83.7	51.2	670.3	.1	4.2	12.3	2.6	1.6	20.9
S-05	90	30.4	316.2	989.6	361.5	73.5	1771.2	.3	3.5	11.0	4.0	.8	19.7
S-81	63	5.8	214.4	1014.1	214.2	97.7	1546.2	.1	3.4	16.1	3.4	1.6	24.5
S-83	60	15.1	220.8	802.2	188.0	112.0	1338.1	.3	3.7	13.4	3.1	1.9	22.3
TOTAL	4172	930.1	15449.5	37417.1	17163.0	3625.5	74585.1	.2	3.7	9.0	4.1	.9	17.9

2000 Three-Yard Directional Gateway Yard

Outbound Classification	Number of Cars	Aggregate Car Hours: Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Average Car Hours/Car: Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	202	38.6	721.3	1747.9	923.1	137.7	3568.7	.2	3.6	8.7	4.6	.7	17.7
BOC	209	40.9	821.8	1232.7	1000.6	1.9	3097.8	.2	3.9	5.9	4.8	.0	14.8
BODA	74	26.1	258.6	967.6	246.7	119.6	1618.6	.4	3.5	13.1	3.3	1.6	21.9
BOK	94	12.5	386.1	865.3	371.3	239.7	1874.9	.1	4.1	9.2	4.0	2.6	19.9
BOW	66	14.7	258.5	860.4	305.8	0.	1439.4	.2	3.9	13.0	4.6	0.	21.8
BOWA	31	10.9	144.6	468.5	100.2	0.	724.1	.4	4.7	15.1	3.2	0.	23.4
CAVE	77	0.	251.9	530.1	314.4	0.	1096.5	0.	3.3	6.9	4.1	0.	14.2
CRAN	225	33.4	880.0	1388.1	1212.4	8.7	3522.5	.1	3.9	6.2	5.4	.0	15.7
CRBF	30	2.2	133.6	429.5	106.5	36.5	708.2	.1	4.5	14.3	3.6	1.2	23.6
CRC	210	40.9	831.1	1152.3	960.2	116.3	3100.7	.2	4.0	5.5	4.6	.6	14.8
CREN	252	68.5	1095.3	1140.9	994.0	339.0	3637.6	.3	4.3	4.5	3.9	1.3	14.4
CRSE	76	20.3	353.9	798.5	287.5	92.5	1552.7	.3	4.7	10.5	3.8	1.2	20.4
CRST	90	24.2	442.7	1618.4	411.0	0.	2496.4	.3	4.9	18.0	4.6	0.	27.7
CWIA	29	8.6	91.0	204.8	147.9	0.	452.3	.3	3.1	7.1	5.1	0.	15.6
CWFK	173	34.7	601.2	1165.2	755.3	135.5	2691.9	.2	3.5	6.7	4.4	.8	15.6
CWVO	127	29.9	438.6	1506.3	611.7	12.7	2599.2	.2	3.5	11.9	4.8	.1	20.5
GCE	72	85.8	167.8	1057.0	261.6	70.8	1642.9	1.2	2.3	14.7	3.6	1.0	22.8
GCW	69	30.8	200.5	920.4	218.5	132.3	1502.4	.4	2.9	13.3	3.2	1.9	21.8
IC	109	23.8	484.9	1214.4	479.7	40.2	2243.0	.2	4.4	11.1	4.4	.4	20.6
INDY	58	7.1	207.2	411.1	157.8	123.1	906.3	.1	3.6	7.1	2.7	2.1	15.6
ITC	89	15.5	330.5	841.6	455.4	0.	1642.9	.2	3.7	9.5	5.1	0.	18.5
LNEV	96	26.2	306.1	841.3	422.4	12.8	1608.8	.3	3.2	8.8	4.4	.1	16.8
LNNA	147	27.6	447.2	1091.0	642.6	92.4	2300.8	.2	3.0	7.4	4.4	.6	15.7
MAD	67	.6	175.2	274.1	223.3	112.8	786.0	.0	2.6	4.1	3.3	1.7	11.7
MPCH	103	30.4	487.7	1276.7	515.0	0.	2309.8	.3	4.7	12.4	5.0	0.	22.4
MPD	27	26.1	90.0	389.7	65.7	69.3	640.8	1.0	3.3	14.4	2.4	2.6	23.7
MPVG	16	4.1	52.3	135.5	59.2	0.	251.1	.3	3.3	8.5	3.7	0.	15.7
MPW	97	20.7	351.2	593.1	298.2	132.6	1395.8	.2	3.6	6.1	3.1	1.4	14.4
MRS	64	11.9	210.1	464.7	178.7	116.7	982.0	.2	3.3	7.3	2.8	1.8	15.3
NWBE	66	15.2	236.0	833.5	292.6	0.	1377.3	.2	3.6	12.6	4.4	0.	20.9
NWCH	20	4.5	65.5	246.9	58.0	42.0	416.9	.2	3.3	12.3	2.9	2.1	20.8
NWDK	79	23.7	297.8	958.0	296.3	159.3	1735.1	.3	3.8	12.1	3.8	2.0	22.0
NWDT	32	7.4	126.9	458.3	92.8	67.2	752.6	.2	4.0	14.3	2.9	2.1	23.5

2000 Three-Yard Directional Gateway Yard

			Aggregate Car Hours					Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NWSC	30	8.7	108.7	452.8	99.5	0.	669.7	.3	3.6	15.1	3.3	0.	22.3
NWW	29	7.0	95.8	297.9	64.8	80.2	545.7	.2	3.3	10.3	2.2	2.8	18.8
NWYD	367	41.6	1252.1	1608.0	1271.6	519.3	4692.5	.1	3.4	4.4	3.5	1.4	12.8
SOCG	94	27.1	275.4	553.4	454.3	105.0	1415.1	.3	2.9	5.9	4.8	1.1	15.1
SODA	63	5.8	214.4	1014.1	214.2	97.7	1546.2	.1	3.4	16.1	3.4	1.6	24.5
SOKN	32	.3	147.1	191.2	126.4	12.8	477.9	.0	4.6	6.0	4.0	.4	14.9
SOLO	60	15.1	220.8	802.2	188.0	112.0	1338.1	.3	3.7	13.4	3.1	1.9	22.3
SOMA	32	4.7	135.9	394.9	83.7	51.2	670.3	.1	4.2	12.3	2.6	1.6	20.9
SOFR	90	30.4	316.2	989.6	361.5	73.5	1771.2	.3	3.5	11.0	4.0	.8	19.7
SSW	129	11.1	514.3	1985.5	606.3	38.7	3156.0	.1	4.0	15.4	4.7	.3	24.5
WFE	70	11.1	221.9	1044.0	226.3	123.7	1627.0	.2	3.2	14.9	3.2	1.8	23.2
TOTAL	4172	930.1	15449.5	37417.1	17163.0	3625.5	74585.1	.2	3.7	9.0	4.1	.9	17.9

2000 Three-Yard Directional Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	519	30.1	1430.5	4297.2	2198.0	375.0	8330.7	.1	2.8	8.3	4.2	.7	16.1
INT-2	603	213.1	1722.2	5943.7	2360.8	538.7	10778.4	.4	2.9	9.9	3.9	.9	17.9
INT-3	728	74.8	2464.9	5517.9	2879.9	718.8	11656.3	.1	3.4	7.6	4.0	1.0	16.0
INT-4	1034	289.7	3500.2	8913.4	4186.2	1074.6	17964.0	.3	3.4	8.6	4.0	1.0	17.4
INT-5	892	229.8	4286.1	8809.1	3842.0	672.0	17839.0	.3	4.8	9.9	4.3	.8	20.0
INT-6	396	92.6	2045.6	3935.9	1696.2	246.4	8016.8	.2	5.2	9.9	4.3	.6	20.2
TOTAL	4172	930.1	15449.5	37417.1	17163.0	3625.5	74585.1	.2	3.7	9.0	4.1	.9	17.9

B.8 Detention Time for 1985 Three-Yard Bidirectional Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	153	21.2	344.4	934.2	676.1	93.9	2069.8	.1	2.3	6.1	4.4	.6	13.5
BN	141	51.7	432.4	1093.3	566.1	91.1	2234.6	.4	3.1	7.8	4.0	.6	15.8
BO	156	26.1	463.2	1328.7	603.6	158.4	2579.9	.2	3.0	8.5	3.9	1.0	16.5
CR	575	90.3	1520.3	4983.4	2638.7	485.9	9718.6	.2	2.6	8.7	4.6	.8	16.9
ICG	141	10.5	365.9	1022.0	606.0	87.1	2091.5	.1	2.6	7.2	4.3	.6	14.8
MF	432	118.3	1250.6	4375.9	1620.7	440.7	7806.3	.3	2.9	10.1	3.8	1.0	18.1
MRS	38	3.8	65.2	307.0	145.7	43.7	565.4	.1	1.7	8.1	3.8	1.2	14.9
NW	160	0.	538.0	1945.3	595.2	177.7	3256.1	0.	3.4	12.2	3.7	1.1	20.4
NWYD	80	0.	170.7	601.4	275.3	44.8	1092.2	0.	2.1	7.5	3.4	.6	13.7
SOU	241	5.9	684.8	2423.0	948.0	231.1	4292.7	.0	2.8	10.1	3.9	1.0	17.8
SSW	513	40.6	1396.3	5182.5	2134.8	380.3	9134.4	.1	2.7	10.1	4.2	.7	17.8
TRRA	104	13.3	175.7	1075.3	416.4	90.9	1771.7	.1	1.7	10.3	4.0	.9	17.0
TOTAL	2734	381.7	7407.4	25271.9	11226.5	2325.6	46613.1	.1	2.7	9.2	4.1	.9	17.0

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	511	74.9	1463.6	3583.7	1696.5	709.9	7528.5	.1	2.9	7.0	3.3	1.4	14.7
BN	84	13.2	217.0	541.9	362.6	57.4	1192.1	.2	2.6	6.5	4.3	.7	14.2
BO	137	22.1	357.3	1406.3	564.2	117.4	2467.4	.2	2.6	10.3	4.1	.9	18.0
CNW	265	20.5	673.9	2163.7	1234.9	96.6	4189.6	.1	2.5	8.2	4.7	.4	15.8
CR	536	51.4	1407.9	5767.7	2809.8	212.0	10248.7	.1	2.6	10.8	5.2	.4	19.1
MP	608	112.3	1668.9	7899.7	2330.7	653.6	12665.2	.2	2.7	13.0	3.8	1.1	20.8
MRS	112	24.7	326.0	414.1	400.8	76.7	1242.3	.2	2.9	3.7	3.6	.7	11.1
NW	51	12.1	140.3	572.5	150.4	28.1	903.2	.2	2.8	11.2	2.9	.6	17.7
SOU	158	14.1	382.9	1455.8	554.0	111.5	2518.2	.1	2.4	9.2	3.5	.7	15.9
SSW	161	25.9	418.8	657.1	750.8	86.8	1939.3	.2	2.6	4.1	4.7	.5	12.0
TRRA	111	10.6	350.9	809.6	371.9	175.7	1718.6	.1	3.2	7.3	3.4	1.6	15.5
TOTAL	2734	381.7	7407.4	25271.9	11226.5	2325.6	46613.1	.1	2.7	9.2	4.1	.9	17.0

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-S02	88	5.9	266.9	480.3	338.5	95.7	1187.3	.1	3.0	5.5	3.8	1.1	13.5
-S04	113	0.	325.8	1556.1	436.1	121.6	2439.7	0.	2.9	13.8	3.9	1.1	21.6
-S06	40	0.	92.0	386.6	173.3	13.8	665.7	0.	2.3	9.7	4.3	.3	16.6
2G11	40	0.	94.0	416.9	174.5	19.7	705.1	0.	2.4	10.4	4.4	.5	17.6
2G24	65	10.8	171.2	280.2	311.1	33.0	806.3	.2	2.6	4.3	4.8	.5	12.4
4E02	8	0.	10.1	88.4	27.1	9.9	135.5	0.	1.3	11.0	3.4	1.2	16.9
4E04	24	0.	58.8	187.6	97.0	26.3	369.7	0.	2.5	7.8	4.0	1.1	15.4
4G02	99	14.9	277.2	587.7	460.7	50.3	1390.7	.2	2.8	5.9	4.7	.5	14.0
4G04	21	.4	40.6	174.4	83.2	11.1	309.6	.0	1.9	8.3	4.0	.5	14.7
4Q04	103	25.8	353.6	878.3	396.4	111.1	1765.2	.3	3.4	8.5	3.8	1.1	17.1
4R04	39	0.	68.3	375.7	120.4	72.6	636.9	0.	1.8	9.6	3.1	1.9	16.3
6D01	109	36.3	363.3	1569.6	382.7	134.4	2486.3	.3	3.3	14.4	3.5	1.2	22.8
7G25	48	10.4	79.2	237.0	190.5	41.3	558.4	.2	1.7	4.9	4.0	.9	11.6
CG12	42	13.3	65.8	330.7	166.8	33.6	610.3	.3	1.6	7.9	4.0	.8	14.5
CG20	52	0.	97.9	585.3	189.0	56.3	928.5	0.	1.9	11.3	3.6	1.1	17.9
LD02	112	0.	336.0	1203.3	458.2	80.1	2077.6	0.	3.0	10.7	4.1	.7	18.5
LG04	141	51.7	432.4	1093.3	566.1	91.1	2234.6	.4	3.1	7.8	4.0	.6	15.8
LG06	116	56.1	311.3	1393.8	465.1	107.6	2333.9	.5	2.7	12.0	4.0	.9	20.1
LG92	160	0.	538.0	1945.3	595.2	177.7	3256.1	0.	3.4	12.2	3.7	1.1	20.4
LR02	94	7.8	220.9	602.7	731.6	6.4	1569.4	.1	2.4	6.4	7.8	.1	16.7
LR04	115	11.5	306.7	820.3	402.8	169.0	1710.2	.1	2.7	7.1	3.5	1.5	14.9
MG26	10	0.	12.0	159.3	60.6	1.0	232.9	0.	1.2	15.9	6.1	.1	23.3
NG22	80	0.	170.7	601.4	275.3	44.8	1092.2	0.	2.1	7.5	3.4	.6	13.7
FG18	38	3.8	65.2	307.0	145.7	43.7	565.4	.1	1.7	8.1	3.8	1.2	14.9
VG09	78	0.	171.6	274.9	352.4	35.7	834.5	0.	2.2	3.5	4.5	.5	10.7
VG23	63	10.5	194.3	747.1	253.7	51.4	1257.0	.2	3.1	11.9	4.0	.8	20.0
XD01	71	0.	293.5	554.5	270.7	63.7	1182.4	0.	4.1	7.8	3.8	.9	16.7
XD05	10	2.2	27.0	96.2	36.0	12.8	174.2	.2	2.7	9.6	3.6	1.3	17.4
XD07	108	0.	304.2	971.4	433.3	83.7	1792.6	0.	2.8	9.0	4.0	.8	16.6
XD09	45	19.5	77.3	497.9	133.8	76.8	805.3	.4	1.7	11.1	3.0	1.7	17.9
XD13	29	4.4	61.4	269.3	121.5	26.2	482.8	.2	2.1	9.3	4.2	.9	16.6
XD15	60	56.0	124.0	417.0	242.6	43.1	882.6	.9	2.1	6.9	4.0	.7	14.7

1985 Three-Yard Bidirectional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
XG01	97	14.6	392.9	1092.1	351.6	109.5	1960.6	.2	4.1	11.3	3.6	1.1	20.2
XG03	84	0.	201.6	1111.4	369.0	42.6	1724.6	0.	2.4	13.2	4.4	.5	20.5
XG05	93	0.	218.6	906.9	417.0	53.4	1595.8	0.	2.4	9.8	4.5	.6	17.2
XG07	57	0.	158.7	489.6	238.0	40.1	926.3	0.	2.8	8.6	4.2	.7	16.3
XG09	45	0.	72.0	428.3	186.8	29.2	716.2	0.	1.6	9.5	4.2	.6	15.9
XG11	71	26.0	164.5	587.9	300.0	54.1	1132.5	.4	2.3	8.3	4.2	.8	16.0
XG13	50	0.	143.3	420.6	211.9	36.5	812.2	0.	2.9	8.4	4.2	.7	16.2
XG30	16	0.	44.8	145.8	60.5	14.9	266.0	0.	2.8	9.1	3.8	.9	16.6
TOTAL	2734	381.7	7407.4	25271.9	11226.5	2325.6	46613.1	.1	2.7	9.2	4.1	.9	17.0

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
5-05	90	3.5	198.1	300.3	420.0	30.0	951.8	.0	2.2	3.3	4.7	.3	10.6
DX04	59	9.7	174.4	940.1	212.4	82.6	1419.2	.2	3.0	15.9	3.6	1.4	24.1
DX06	83	20.9	229.9	959.1	343.1	71.9	1624.9	.3	2.8	11.6	4.1	.9	19.6
DX10	67	10.3	191.2	1022.0	289.2	45.8	1558.5	.2	2.9	15.3	4.3	.7	23.3
DX16	33	10.8	56.9	444.3	80.8	84.2	677.0	.3	1.7	13.5	2.5	2.6	20.5
DX18	60	3.4	155.9	602.7	211.0	84.0	1057.0	.1	2.6	10.0	3.5	1.4	17.6
DX20	65	5.1	154.3	803.6	274.3	0.	1237.3	.1	2.4	12.4	4.2	0.	19.0
DX72	59	16.6	183.2	1159.5	200.6	94.4	1654.4	.3	3.1	19.7	3.4	1.6	28.0
DX74	73	3.6	224.0	561.8	300.5	64.5	1154.4	.0	3.1	7.7	4.1	.9	15.8
DX76	76	25.8	216.5	906.4	319.2	60.8	1528.7	.3	2.8	11.9	4.2	.8	20.1
DX98	33	6.1	82.6	500.3	99.5	65.5	754.0	.2	2.5	15.2	3.0	2.0	22.8
G214	62	1.1	186.1	323.3	250.1	0.	760.5	.0	3.0	5.2	4.0	0.	12.3
G226	61	24.0	161.7	379.8	249.1	0.	814.6	.4	2.7	6.2	4.1	0.	13.4
G401	28	3.2	99.0	53.2	64.9	75.1	295.4	.1	3.5	1.9	2.3	2.7	10.5
G403	66	7.2	185.5	1165.8	272.0	8.8	1639.3	.1	2.8	17.7	4.1	.1	24.8
G444	57	3.9	185.8	283.7	195.7	89.3	758.4	.1	3.3	5.0	3.4	1.6	13.3
G491	59	16.6	149.4	193.5	251.7	43.3	654.5	.3	2.5	3.3	4.3	.7	11.1
G493	78	5.5	208.0	1212.9	312.5	74.1	1812.9	.1	2.7	15.5	4.0	.9	23.2
G501	74	7.9	193.3	827.0	294.8	66.6	1389.6	.1	2.6	11.2	4.0	.9	18.8
G571	101	9.1	282.5	1036.5	520.1	0.	1848.2	.1	2.8	10.3	5.1	0.	18.3
G722	25	1.7	70.2	173.0	56.3	68.8	369.8	.1	2.8	6.9	2.3	2.8	14.8
G902	9	0.	20.0	73.1	18.5	25.8	137.4	0.	2.2	8.1	2.1	2.9	15.3
GA08	30	5.0	92.9	419.3	71.0	79.0	667.1	.2	3.1	14.0	2.4	2.6	22.2
GC14	65	8.2	201.8	269.6	223.2	101.8	804.6	.1	3.1	4.1	3.4	1.6	12.4
GC30	13	0.	22.8	81.3	26.2	38.8	169.0	0.	1.8	6.3	2.0	3.0	13.0
GL03	51	12.1	140.3	572.5	150.4	28.1	903.2	.2	2.8	11.2	2.9	.6	17.7
GL05	84	13.2	217.0	541.9	362.6	57.4	1192.1	.2	2.6	6.5	4.3	.7	14.2
GL10	54	6.8	165.1	525.9	176.2	86.4	960.3	.1	3.1	9.7	3.3	1.6	17.8
GM22	38	2.4	101.8	189.6	99.4	90.6	483.8	.1	2.7	5.0	2.6	2.4	12.7
GN14	43	5.1	110.5	259.1	129.0	86.0	589.7	.1	2.6	6.0	3.0	2.0	13.7
GN22	70	11.4	221.6	465.1	281.2	68.8	1048.1	.2	3.2	6.6	4.0	1.0	15.0
GF11	45	8.0	122.5	111.8	139.5	55.5	437.3	.2	2.7	2.5	3.1	1.2	9.7
GF22	67	16.7	203.5	302.3	261.3	21.2	805.0	.2	3.0	4.5	3.9	.3	12.0

1985 Three-Yard Bidirectional Gateway Yard

Outbound Train	Number of Cars	Aggregate Car Hours Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Average Car Hours/Car Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
GV17	47	4.0	139.9	390.4	163.7	56.4	754.4	.1	3.0	8.3	3.5	1.2	16.1
GV27	21	8.3	51.7	126.8	56.0	31.9	274.6	.4	2.5	6.0	2.7	1.5	13.1
GW17	27	3.8	82.8	433.5	72.9	62.1	655.1	.1	3.1	16.1	2.7	2.3	24.3
R401	54	5.9	132.7	815.9	201.6	52.2	1208.3	.1	2.5	15.1	3.7	1.0	22.4
R405	92	7.9	223.2	649.4	444.7	15.3	1340.5	.1	2.4	7.1	4.8	.2	14.6
R407	166	17.6	421.9	1605.6	1239.5	0.	3284.5	.1	2.5	9.7	7.5	0.	19.8
R411	97	6.4	257.9	972.1	488.2	0.	1724.6	.1	2.7	10.0	5.0	0.	17.8
RL01	33	3.3	87.7	505.7	99.0	60.5	756.2	.1	2.7	15.3	3.0	1.8	22.9
S-05	75	2.2	174.2	721.0	276.8	0.	1174.1	.0	2.3	9.6	3.7	0.	15.7
S-81	52	7.7	128.8	345.0	200.7	32.9	715.2	.1	2.5	6.6	3.9	.6	13.8
S-83	31	4.2	80.0	389.8	76.5	78.5	628.9	.1	2.6	12.6	2.5	2.5	20.3
VX02	1	.9	2.1	24.1	2.0	3.0	32.1	.9	2.1	24.1	2.0	3.0	32.1
VX14	85	13.7	234.1	321.2	457.6	0.	1026.5	.2	2.8	3.8	5.4	0.	12.1
VX92	75	11.3	182.6	311.9	291.3	83.8	880.7	.2	2.4	4.2	3.9	1.1	11.7
TOTAL	2734	381.7	7407.4	25271.9	11226.5	2325.6	46613.1	.1	2.7	9.2	4.1	.9	17.0

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
ASI	30	5.0	92.9	419.3	71.0	79.0	667.1	.2	3.1	14.0	2.4	2.6	22.2
BNGL	84	13.2	217.0	541.9	362.6	57.4	1192.1	.2	2.6	6.5	4.3	.7	14.2
BOC	44	4.2	125.1	659.8	178.2	41.8	1009.1	.1	2.8	15.0	4.1	.9	22.9
BOL	34	1.3	82.8	553.1	134.3	32.3	803.8	.0	2.4	16.3	4.0	.9	23.6
BOT	116	20.5	335.2	477.2	447.4	132.6	1412.8	.2	2.9	4.1	3.9	1.1	12.2
CAVE	78	8.2	224.6	350.8	249.4	140.6	973.6	.1	2.9	4.5	3.2	1.8	12.5
CRAN	166	17.6	421.9	1605.6	1239.5	0.	3284.5	.1	2.5	9.7	7.5	0.	19.8
CRBF	19	1.0	53.9	375.6	72.2	2.5	505.2	.1	2.8	19.8	3.8	.1	26.6
CRC	97	6.4	257.9	972.1	488.2	0.	1724.6	.1	2.7	10.0	5.0	0.	17.8
CREA	33	3.3	87.7	505.7	99.0	60.5	756.2	.1	2.7	15.3	3.0	1.8	22.9
CREN	120	11.1	322.2	702.6	509.5	90.5	1635.8	.1	2.7	5.9	4.2	.8	13.6
CRSE	47	6.2	131.6	790.2	199.8	6.3	1134.1	.1	2.8	16.8	4.3	.1	24.1
CRST	54	5.9	132.7	815.9	201.6	52.2	1208.3	.1	2.5	15.1	3.7	1.0	22.4
CWFK	191	12.6	480.6	1336.7	940.1	30.0	2800.0	.1	2.5	7.0	4.9	.2	14.7
CWVO	74	7.9	193.3	827.0	294.8	66.6	1389.6	.1	2.6	11.2	4.0	.9	18.8
FOX	9	0.	20.0	73.1	18.5	25.8	137.4	0.	2.2	8.1	2.1	2.9	15.3
IC	68	12.3	191.5	517.2	219.7	88.3	1029.0	.2	2.8	7.6	3.2	1.3	15.1
ITC	25	1.7	70.2	173.0	56.3	68.8	369.8	.1	2.8	6.9	2.3	2.8	14.8
MAD	38	2.4	101.8	189.6	99.4	90.6	483.8	.1	2.7	5.0	2.6	2.4	12.7
MFAR	12	1.2	35.5	225.3	36.2	23.8	322.0	.1	3.0	18.8	3.0	2.0	26.8
MPCR	46	14.6	149.4	983.4	156.4	73.6	1377.4	.3	3.2	21.4	3.4	1.6	29.9
MPDA	67	10.3	191.2	1022.0	289.2	45.8	1558.5	.2	2.9	15.3	4.3	.7	23.3
MPDX	13	2.0	33.9	176.2	44.2	20.8	277.0	.2	2.6	13.6	3.4	1.6	21.3
MPFE	76	25.8	216.5	906.4	319.2	60.8	1528.7	.3	2.8	11.9	4.2	.8	20.1
MPFW	21	4.9	47.1	275.0	63.4	41.7	431.9	.2	2.2	13.1	3.0	2.0	20.6
MPHO	59	9.7	174.4	940.1	212.4	82.6	1419.2	.2	3.0	15.9	3.6	1.4	24.1
MPLA	73	3.6	224.0	561.8	300.5	64.5	1154.4	.0	3.1	7.7	4.1	.9	15.8
MPLR	60	3.4	155.9	602.7	211.0	84.0	1057.0	.1	2.6	10.0	3.5	1.4	17.6
MPMP	53	.5	126.5	655.5	227.9	0.	1010.4	.0	2.4	12.4	4.3	0.	19.1
MPNO	83	20.9	229.9	959.1	343.1	71.9	1624.9	.3	2.8	11.6	4.1	.9	19.6
MPSA	12	4.6	27.8	148.2	46.4	0.	226.9	.4	2.3	12.3	3.9	0.	18.9
MPSP	33	10.8	56.9	444.3	80.8	84.2	677.0	.3	1.7	13.5	2.5	2.6	20.5
MPW	123	25.2	347.7	703.0	499.2	0.	1575.1	.2	2.8	5.7	4.1	0.	12.8
MRS	112	24.7	326.0	414.1	400.8	76.7	1242.3	.2	2.9	3.7	3.6	.7	11.1

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NWBE	40	5.7	131.0	353.4	130.7	64.0	684.7	.1	3.3	8.8	3.3	1.6	17.1
NWCH	32	6.9	87.9	352.7	86.4	17.6	551.5	.2	2.7	11.0	2.7	.6	17.2
NWDK	14	1.1	34.1	172.5	45.5	22.4	275.6	.1	2.4	12.3	3.3	1.6	19.7
NWDT	19	5.1	52.4	219.8	64.0	10.5	351.7	.3	2.8	11.6	3.4	.5	18.5
NWW	27	3.8	82.8	433.5	72.9	62.1	655.1	.1	3.1	16.1	2.7	2.3	24.3
NWYD	113	16.4	332.1	724.1	410.2	154.8	1637.7	.1	2.9	6.4	3.6	1.4	14.5
SOCG	48	7.7	120.3	342.7	188.8	30.4	689.9	.2	2.5	7.1	3.9	.6	14.4
SOCI	4	0.	8.5	2.3	11.9	2.5	25.3	0.	2.1	.6	3.0	.6	6.3
SOKN	42	0.	89.6	335.3	139.3	0.	564.2	0.	2.1	8.0	3.3	0.	13.4
SOLO	33	2.2	84.6	385.7	137.5	0.	609.9	.1	2.6	11.7	4.2	0.	18.5
SOFR	31	4.2	80.0	389.8	76.5	78.5	628.9	.1	2.6	12.6	2.5	2.5	20.3
SSW	161	25.9	418.8	657.1	750.8	86.8	1939.3	.2	2.6	4.1	4.7	.5	12.0
TOTAL	2734	381.7	7407.4	25271.9	11226.5	2325.6	46613.1	.1	2.7	9.2	4.1	.9	17.0

1985 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Time of Day Interval	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	395	10.5	1092.9	4265.7	1486.5	344.0	7199.5	.0	2.8	10.8	3.8	.9	18.2
INT-2	631	74.1	2052.3	5992.3	2469.1	582.4	11170.2	.1	3.3	9.5	3.9	.9	17.7
INT-3	398	36.2	1066.3	4359.1	1627.1	337.2	7425.8	.1	2.7	11.0	4.1	.8	18.7
INT-4	602	54.6	1455.2	4688.6	2456.1	513.3	9167.7	.1	2.4	7.8	4.1	.9	15.2
INT-5	604	195.5	1501.3	5310.4	2756.3	443.2	10206.7	.3	2.5	8.8	4.6	.7	16.9
INT-6	104	10.8	239.4	655.9	431.5	105.6	1443.2	.1	2.3	6.3	4.1	1.0	13.9
TOTAL	2734	381.7	7407.4	25271.9	11226.5	2325.6	46613.1	.1	2.7	9.2	4.1	.9	17.0

B.9 Detention Time for 2000 Three-Yard Bidirectional Gateway Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

2000 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	172	11.9	640.1	1354.9	851.2	43.9	2901.9	.1	3.7	7.9	4.9	.3	16.9
BN	102	0.	365.5	770.0	493.5	20.8	1649.7	0.	3.6	7.5	4.8	.2	16.2
BO	257	94.9	1140.5	2286.0	1244.1	47.5	4812.9	.4	4.4	8.9	4.8	.2	18.7
CR	594	73.0	2201.2	6406.7	2808.9	225.5	11715.2	.1	3.7	10.8	4.7	.4	19.7
ICG	204	15.3	753.9	2997.4	1015.6	34.2	4816.5	.1	3.7	14.7	5.0	.2	23.6
MP	361	267.0	1561.1	3404.0	1576.7	172.1	6980.8	.7	4.3	9.4	4.4	.5	19.3
MRS	52	5.2	169.0	336.0	263.5	15.5	789.2	.1	3.3	6.5	5.1	.3	15.2
NW	211	81.3	574.5	2319.5	997.3	71.0	4043.7	.4	2.7	11.0	4.7	.3	19.2
NWYD	40	0.	79.2	391.7	196.4	36.3	703.5	0.	1.7	8.2	4.1	.8	14.7
SOU	273	34.9	1112.9	2738.9	1148.2	148.2	5183.1	.1	4.1	10.0	4.2	.5	19.0
SSW	830	149.1	3146.1	8152.2	4262.4	169.7	15879.6	.2	3.8	9.8	5.1	.2	19.1
TRRA	158	0.	338.0	1743.1	693.6	97.6	2872.2	0.	2.1	11.0	4.4	.6	18.2
TOTAL	3262	732.5	12082.0	32900.1	15551.4	1082.3	62348.2	.2	3.7	10.1	4.8	.3	19.1

2000 Three-Yard Bidirectional Gateway Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	685	176.5	2700.5	5804.9	2809.4	427.3	11918.5	.3	3.9	8.5	4.1	.6	17.4
BN	101	23.5	427.9	1192.3	519.1	.9	2163.7	.2	4.2	11.8	5.1	.0	21.4
BO	161	22.1	673.6	1623.6	757.8	37.3	3114.3	.1	4.2	10.1	4.7	.2	19.3
CNW	294	30.0	1108.5	3445.2	1511.5	57.2	6152.3	.1	3.8	11.7	5.1	.2	20.9
CR	642	54.2	2347.9	6751.9	3657.9	107.9	12919.8	.1	3.7	10.5	5.7	.2	20.1
MP	790	258.5	2735.3	9485.5	3782.8	245.4	16507.5	.3	3.5	12.0	4.8	.3	20.9
MRS	81	30.7	277.3	522.3	289.2	25.8	1145.3	.4	3.4	6.4	3.6	.3	14.1
NW	63	34.8	225.6	732.2	316.0	0.	1308.6	.6	3.6	11.6	5.0	0.	20.8
SOU	147	26.6	486.0	1397.1	498.6	141.1	2549.3	.2	3.3	9.5	3.4	1.0	17.3
SSW	156	17.6	572.3	753.3	841.2	12.9	2197.3	.1	3.7	4.8	5.4	.1	14.1
TRRA	142	58.2	527.1	1191.9	560.0	26.4	2371.6	.4	3.7	8.4	4.0	.2	16.7
TOTAL	3262	732.5	12082.0	32900.1	15551.4	1082.3	62348.2	.2	3.7	10.1	4.8	.3	19.1

2000 Three-Yard Bidirectional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-S02	91	34.9	212.3	561.1	379.3	49.6	1237.2	.4	2.3	6.2	4.2	.5	13.6
-S04	123	0.	770.8	1534.7	491.5	97.8	2894.8	0.	6.3	12.5	4.0	.8	23.5
-S06	59	0.	129.8	643.1	277.5	.8	1051.2	0.	2.2	10.9	4.7	.0	17.8
2G11	48	0.	128.8	459.9	271.8	2.5	863.0	0.	2.7	9.6	5.7	.1	18.0
2G24	73	0.	328.5	415.9	335.8	23.6	1103.8	0.	4.5	5.7	4.6	.3	15.1
4E02	12	0.	13.2	130.0	57.2	0.	200.4	0.	1.1	10.8	4.8	0.	16.7
4E04	37	7.4	198.0	445.7	174.2	15.8	841.1	.2	5.4	12.0	4.7	.4	22.7
4G02	59	19.7	182.9	667.3	282.1	12.1	1164.1	.3	3.1	11.3	4.8	.2	19.7
4G04	112	63.5	490.9	921.2	531.0	16.8	2023.4	.6	4.4	8.2	4.7	.2	18.1
4Q04	96	24.0	438.4	789.0	481.8	14.9	1748.1	.3	4.6	8.2	5.0	.2	18.2
4R04	56	0.	151.2	510.3	219.2	53.8	934.4	0.	2.7	9.1	3.9	1.0	16.7
6D01	135	200.3	765.1	1526.7	586.6	75.2	3153.7	1.5	5.7	11.3	4.3	.6	23.4
7G25	51	11.9	182.8	479.1	243.6	17.8	935.1	.2	3.6	9.4	4.8	.3	18.3
CG12	65	0.	169.0	637.7	273.4	34.5	1114.5	0.	2.6	9.8	4.2	.5	17.1
CG20	67	0.	129.5	775.8	253.9	63.1	1222.4	0.	1.9	11.6	3.8	.9	18.2
LD02	149	0.	477.3	1754.1	761.5	17.2	3010.1	0.	3.2	11.8	5.1	.1	20.2
LD82	125	81.3	366.7	1178.8	628.0	22.0	2276.7	.7	2.9	9.4	5.0	.2	18.2
LG04	102	0.	365.5	770.0	493.5	20.8	1649.7	0.	3.6	7.5	4.8	.2	16.2
LG06	153	45.9	608.6	1676.4	751.3	30.5	3112.7	.3	4.0	11.0	4.9	.2	20.3
LG92	86	0.	207.8	1140.7	369.4	49.0	1767.0	0.	2.4	13.3	4.3	.6	20.5
LR02	29	0.	154.7	255.2	161.6	7.0	578.4	0.	5.3	8.8	5.6	.2	19.9
LR04	148	7.4	626.5	1543.4	633.3	104.9	2915.5	.1	4.2	10.4	4.3	.7	19.7
MG26	26	0.	39.4	329.6	166.3	0.	535.3	0.	1.5	12.7	6.4	0.	20.6
NG22	48	0.	79.2	391.7	196.4	36.3	703.5	0.	1.7	8.2	4.1	.8	14.7
PG18	52	5.2	169.0	336.0	263.5	15.5	789.2	.1	3.3	6.5	5.1	.3	15.2
VG09	112	0.	504.0	1813.7	573.3	26.1	2917.2	0.	4.5	16.2	5.1	.2	26.0
VG23	92	15.3	249.9	1183.6	442.4	8.1	1899.3	.2	2.7	12.9	4.8	.1	20.6
XD01	50	28.3	201.7	324.4	222.7	11.6	788.6	.6	4.0	6.5	4.5	.2	15.8

2000 Three-Yard Bidirectional Gateway Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
XD05	8	4.1	18.9	69.1	38.9	5.4	136.4	.5	2.4	8.6	4.9	.7	17.1
XD07	76	0.	214.1	653.1	343.4	27.0	1237.5	0.	2.8	8.6	4.5	.4	16.3
XD09	34	14.7	78.2	371.2	125.7	30.6	620.5	.4	2.3	10.9	3.7	.9	18.2
XD13	19	0.	106.4	164.4	89.9	7.2	367.9	0.	5.6	8.7	4.7	.4	19.4
XD15	39	19.5	176.8	295.2	169.5	15.2	676.1	.5	4.5	7.6	4.3	.4	17.3
XG01	93	97.7	297.6	1011.4	376.8	36.0	1819.4	1.1	3.2	10.9	4.1	.4	19.6
XG03	130	0.	429.0	1468.7	724.5	13.9	2636.0	0.	3.3	11.3	5.6	.1	20.3
XG05	151	0.	574.7	1700.3	799.1	14.4	3088.5	0.	3.8	11.3	5.3	.1	20.5
XG07	90	0.	378.0	707.6	486.6	12.3	1584.5	0.	4.2	7.9	5.4	.1	17.6
XG09	65	0.	201.5	646.5	350.2	7.3	1205.5	0.	3.1	9.9	5.4	.1	18.5
XG11	110	45.8	561.0	1112.7	550.7	24.8	2295.0	.4	5.1	10.1	5.0	.2	20.9
XG13	84	0.	420.0	647.4	419.1	29.0	1515.4	0.	5.0	7.7	5.0	.3	18.0
XG30	26	5.6	61.5	242.3	123.2	3.6	436.2	.2	2.4	9.3	4.7	.1	16.8
XG72	81	0.	222.8	615.4	432.3	28.5	1299.0	0.	2.8	7.6	5.3	.4	16.0
TOTAL	3262	732.5	12082.0	32900.1	15551.4	1082.3	62348.2	.2	3.7	10.1	4.8	.3	19.1

2000 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
5-05	88	10.2	344.7	1155.4	382.8	57.2	1950.3	.1	3.9	13.1	4.4	.6	22.2
DX04	79	26.6	275.2	975.6	364.7	0.	1642.1	.3	3.5	12.3	4.6	0.	20.8
DX06	100	36.7	323.2	516.6	521.7	0.	1398.2	.4	3.2	5.2	5.2	0.	14.0
DX10	87	18.5	301.6	1063.6	398.8	36.3	1818.8	.2	3.5	12.2	4.6	.4	20.9
DX16	46	16.0	131.4	589.5	129.5	78.2	944.6	.3	2.9	12.8	2.8	1.7	20.5
DX18	94	15.2	325.5	1111.8	493.5	0.	1945.9	.2	3.5	11.8	5.3	0.	20.7
DX20	90	3.1	217.7	1301.6	375.5	0.	1897.9	.0	2.4	14.5	4.2	0.	21.1
DX72	58	76.4	321.9	1013.3	242.6	47.4	1701.6	1.3	5.6	17.5	4.2	.8	29.3
DX74	102	23.6	321.3	1160.3	639.2	0.	2144.3	.2	3.2	11.4	6.3	0.	21.0
DX76	90	28.4	380.5	1184.4	481.5	0.	2074.8	.3	4.2	13.2	5.4	0.	23.1
DX98	44	14.0	136.9	569.0	135.9	83.6	939.4	.3	3.1	12.9	3.1	1.9	21.4
G214	61	28.9	228.1	215.3	228.8	0.	701.1	.5	3.7	3.5	3.8	0.	11.5
G226	77	15.5	297.1	467.6	314.4	0.	1094.7	.2	3.9	6.1	4.1	0.	14.2
G401	33	9.7	115.0	249.0	106.2	58.9	538.7	.3	3.5	7.5	3.2	1.8	16.3
G403	88	5.2	336.3	1139.2	403.6	0.	1884.3	.1	3.8	12.9	4.6	0.	21.4
G444	72	33.0	275.5	359.1	282.0	26.4	976.1	.5	3.8	5.0	3.9	.4	13.6
G491	77	7.5	350.3	441.1	340.1	35.9	1174.9	.1	4.5	5.7	4.4	.5	15.3
G493	84	14.6	323.3	1182.5	417.7	1.4	1939.4	.2	3.8	14.1	5.0	.0	23.1
G501	99	14.0	363.1	999.7	509.9	0.	1886.7	.1	3.7	10.1	5.2	0.	19.1
G571	107	5.8	400.7	1290.1	618.8	0.	2315.4	.1	3.7	12.1	5.8	0.	21.6
G722	41	7.7	171.8	282.6	108.7	96.3	667.1	.2	4.2	6.9	2.7	2.4	16.3
G902	13	0.	28.1	100.6	32.5	32.5	193.6	0.	2.2	7.7	2.5	2.5	14.9
GA08	23	0.	71.1	460.3	59.0	54.8	645.2	0.	3.1	20.0	2.6	2.4	28.1
GC14	73	43.1	271.2	275.7	295.7	57.2	942.7	.6	3.7	3.8	4.1	.8	12.9
GC30	46	0.	227.6	529.9	135.7	94.3	987.6	0.	4.9	11.5	3.0	2.1	21.5
GL03	63	34.8	225.6	732.2	316.0	0.	1308.6	.6	3.6	11.6	5.0	0.	20.8
GL05	101	23.5	427.9	1192.3	519.1	.9	2163.7	.2	4.2	11.8	5.1	.0	21.4
GL10	70	25.1	251.6	832.8	286.0	0.	1395.5	.4	3.6	11.9	4.1	0.	19.9
GM22	53	3.4	260.9	911.4	208.5	56.5	1440.6	.1	4.9	17.2	3.9	1.1	27.2

2000 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
ASI	23	0.	71.1	460.3	59.0	54.8	645.2	0.	3.1	20.0	2.6	2.4	28.1
BNGL	101	23.5	427.9	1192.3	519.1	.9	2163.7	.2	4.2	11.8	5.1	.0	21.4
BOC	55	14.1	210.6	761.3	273.2	.9	1260.0	.3	3.8	13.8	5.0	.0	22.9
BOL	29	.5	112.7	421.2	144.5	.5	679.4	.0	3.9	14.5	5.0	.0	23.4
BOT	149	40.6	625.8	800.2	622.1	62.3	2151.0	.3	4.2	5.4	4.2	.4	14.4
CAVE	119	43.1	498.8	805.6	431.4	151.5	1930.3	.4	4.2	6.8	3.6	1.3	16.2
CRAN	125	14.7	448.2	1067.5	808.9	0.	2339.4	.1	3.6	8.5	6.5	0.	18.7
CRBF	30	1.4	109.2	445.2	145.5	0.	701.2	.0	3.6	14.8	4.9	0.	23.4
CRC	126	10.7	442.0	1654.4	775.8	0.	2882.8	.1	3.5	13.1	6.2	0.	22.9
CREA	31	1.5	132.3	452.2	74.9	49.1	710.1	.0	4.3	14.6	2.4	1.6	22.9
CREN	175	16.4	626.3	1189.0	998.1	58.9	2888.6	.1	3.6	6.8	5.7	.3	16.5
CRSE	58	3.8	227.1	694.1	258.1	0.	1183.1	.1	3.9	12.0	4.4	0.	20.4
CRST	97	5.7	362.9	1249.6	596.6	0.	2214.7	.1	3.7	12.9	6.1	0.	22.8
CWPK	195	16.0	745.4	2445.5	1001.6	57.2	4265.7	.1	3.8	12.5	5.1	.3	21.9
CWVO	99	14.0	363.1	999.7	509.9	0.	1886.7	.1	3.7	10.1	5.2	0.	19.1
FOX	13	0.	20.1	100.6	32.5	32.5	193.6	0.	2.2	7.7	2.5	2.5	14.9
IC	92	24.5	341.9	644.0	389.4	31.9	1431.7	.3	3.7	7.0	4.2	.3	15.6
ITC	41	7.7	171.8	282.6	108.7	96.3	667.1	.2	4.2	6.9	2.7	2.4	16.3
MAD	53	3.4	260.9	911.4	208.5	56.5	1440.6	.1	4.9	17.2	3.9	1.1	27.2
MPAR	14	6.2	41.2	172.0	43.4	26.6	289.5	.4	2.9	12.3	3.1	1.9	20.7
MPCR	58	76.4	321.9	1013.3	242.6	47.4	1701.6	1.3	5.6	17.5	4.2	.8	29.3
MPDA	87	18.5	301.6	1063.6	398.8	36.3	1818.8	.2	3.5	12.2	4.6	.4	20.9
MPDX	15	8.6	54.7	196.6	45.8	25.5	331.0	.6	3.6	13.1	3.1	1.7	22.1
MPFE	90	28.4	380.5	1184.4	481.5	0.	2074.8	.3	4.2	13.2	5.4	0.	23.1
MPFW	30	7.8	95.7	397.0	92.5	57.0	650.0	.3	3.2	13.2	3.1	1.9	21.7
MPHO	79	26.6	275.2	975.6	364.7	0.	1642.1	.3	3.5	12.3	4.6	0.	20.8
MPLA	102	23.6	321.3	1160.3	639.2	0.	2144.3	.2	3.2	11.4	6.3	0.	21.0
MPLR	94	15.2	325.5	1111.8	493.5	0.	1945.9	.2	3.5	11.8	5.3	0.	20.7
MPMP	75	1.3	172.7	1083.3	306.3	0.	1563.6	.0	2.3	14.4	4.1	0.	20.8

2000 Three-Yard Bidirectional Gateway Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
MFNO	100	36.7	323.2	516.6	521.7	0.	1398.2	.4	3.2	5.2	5.2	0.	14.0
MFSA	15	1.8	45.0	218.3	69.3	0.	334.4	.1	3.0	14.6	4.6	0.	22.3
MFSF	31	7.4	76.8	393.0	83.7	52.7	613.5	.2	2.5	12.7	2.7	1.7	19.8
MFW	138	44.4	525.3	683.0	543.2	0.	1795.8	.3	3.8	4.9	3.9	0.	13.0
MRS	81	30.7	277.3	522.3	289.2	25.8	1145.3	.4	3.4	6.4	3.6	.3	14.1
NWBE	50	23.7	173.3	522.3	196.7	0.	915.9	.5	3.5	10.4	3.9	0.	18.3
NWCH	39	21.4	147.2	431.6	168.4	0.	768.6	.5	3.8	11.1	4.3	0.	19.7
NWDK	20	1.5	78.3	310.5	89.3	0.	479.6	.1	3.9	15.5	4.5	0.	24.0
NWDT	24	13.4	78.4	300.6	147.6	0.	540.0	.6	3.3	12.5	6.1	0.	22.5
NWW	41	9.5	187.5	695.6	166.1	0.	1058.6	.2	4.6	17.0	4.1	0.	25.8
NWYD	165	44.0	615.2	1221.7	870.8	3.8	2755.5	.3	3.7	7.4	5.3	.0	16.7
SOCG	62	1.6	250.4	407.2	228.4	34.1	921.7	.0	4.0	6.6	3.7	.6	14.9
SOLO	47	12.5	138.7	514.4	151.2	36.0	852.7	.3	3.0	10.9	3.2	.8	18.1
SOFR	38	12.6	96.9	475.5	119.1	70.9	774.9	.3	2.5	12.5	3.1	1.9	20.4
SSW	156	17.6	572.3	753.3	841.2	12.9	2197.3	.1	3.7	4.8	5.4	.1	14.1
TOTAL	3262	732.5	12082.0	32900.1	15551.4	1082.3	62348.2	.2	3.7	10.1	4.8	.3	19.1

2000 Three-Yard Bidirectional Gateway Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	352	15.3	796.3	4134.9	1539.5	157.3	6643.3	.0	2.3	11.7	4.4	.4	18.9
INT-2	735	454.0	2721.4	7207.5	3359.2	227.4	13969.6	.6	3.7	9.8	4.6	.3	19.0
INT-3	474	35.9	1989.2	5061.0	2379.3	146.9	9612.3	.1	4.2	10.7	5.0	.3	20.3
INT-4	804	58.4	3196.3	8504.5	3923.2	259.5	15941.9	.1	4.0	10.6	4.9	.3	19.8
INT-5	687	168.8	2676.3	6450.7	3362.9	185.4	12844.0	.2	3.9	9.4	4.9	.3	18.7
INT-6	210	0.	702.5	1541.5	987.3	106.0	3337.2	0.	3.3	7.3	4.7	.5	15.9
TOTAL	3262	732.5	12082.0	32900.1	15551.4	1082.3	62348.2	.2	3.7	10.1	4.8	.3	19.1

B.10 Detention Time for 1979 No Build Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1979 No Build Madison Yard

Inbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	82	0.	161.5	1246.7	264.9	82.4	1755.6	0.	2.0	15.2	3.2	1.0	21.4
IC	63	0.	114.5	746.8	202.9	69.1	1133.2	0.	1.8	11.9	3.2	1.1	18.0
ITC	114	0.	248.6	1010.5	356.7	150.8	1766.6	0.	2.2	8.9	3.1	1.3	15.5
MP	78	0.	224.8	609.2	245.4	134.7	1214.1	0.	2.9	7.8	3.1	1.7	15.6
NW	45	0.	120.0	433.9	137.1	75.3	766.3	0.	2.7	9.6	3.0	1.7	17.0
SLSF	46	0.	95.3	483.4	130.2	86.9	795.8	0.	2.1	10.5	2.8	1.9	17.3
TRRA	819	34.0	1832.1	7340.7	2532.4	1326.6	13065.7	.0	2.2	9.0	3.1	1.6	16.0
TOTAL	1247	34.0	2796.7	11871.2	3869.6	1925.8	20497.2	.0	2.2	9.5	3.1	1.5	16.4

1979 No Build Madison Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	133	3.0	317.0	1300.9	465.1	97.5	2183.5	.0	2.4	9.8	3.5	.7	16.4
MF	21	1.2	49.2	229.3	38.9	71.4	389.9	.1	2.3	10.9	1.9	3.4	18.6
TRRA	1093	29.8	2430.5	10341.0	3365.7	1756.9	17923.9	.0	2.2	9.5	3.1	1.6	16.4
TOTAL	1247	34.0	2796.7	11871.2	3869.6	1925.8	20497.2	.0	2.2	9.5	3.1	1.5	16.4

1979 No Build Madison Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
1C05	20	3.7	53.7	158.2	53.9	33.8	303.3	.2	2.7	7.9	2.7	1.7	15.2
2M01	37	4.3	111.6	195.9	117.5	45.4	474.7	.1	3.0	5.3	3.2	1.2	12.8
2M02	46	3.8	138.0	379.2	143.0	71.4	735.4	.1	3.0	8.2	3.1	1.6	16.0
2M03	40	3.3	65.3	647.5	114.1	64.8	895.1	.1	1.6	16.2	2.9	1.6	22.4
2M05	82	0.	232.0	870.9	232.0	129.0	1463.8	0.	2.8	10.6	2.8	1.6	17.9
2M07	56	0.	96.1	472.1	157.1	113.3	838.7	0.	1.7	8.4	2.8	2.0	15.0
2M08	21	0.	51.5	174.4	56.4	61.3	343.6	0.	2.5	8.3	2.7	2.9	16.4
6207	17	0.	30.0	192.3	40.4	40.7	303.4	0.	1.8	11.3	2.4	2.4	17.8
6223	29	0.	65.3	291.1	89.9	46.2	492.5	0.	2.3	10.0	3.1	1.6	17.0
6M01	78	0.	224.8	609.2	245.4	134.7	1214.1	0.	2.9	7.8	3.1	1.7	15.6
7M10	74	0.	189.9	651.9	216.9	121.7	1180.4	0.	2.6	8.8	2.9	1.6	16.0
BM03	6	0.	12.7	53.0	20.7	7.0	93.4	0.	2.1	8.8	3.5	1.2	15.6
CM01	39	0.	112.5	560.9	115.7	100.5	889.5	0.	2.9	14.4	3.0	2.6	22.8
CM03	62	0.	138.5	332.2	190.1	162.7	823.5	0.	2.2	5.4	3.1	2.6	13.3
CM07	31	0.	50.1	402.9	97.8	63.0	613.8	0.	1.6	13.0	3.2	2.0	19.8
CM09	32	0.	69.9	667.4	88.6	64.3	890.2	0.	2.2	20.9	2.8	2.0	27.8
CM19	64	11.7	141.9	560.9	210.7	119.5	1044.7	.2	2.2	8.8	3.3	1.9	16.3
FM11	59	0.	113.1	397.4	203.4	70.8	784.6	0.	1.9	6.7	3.4	1.2	13.3
HM02	63	0.	114.5	315.3	240.6	48.4	718.6	0.	1.8	5.0	3.8	.8	11.4
HM06	12	0.	27.2	102.4	37.8	18.2	185.6	0.	2.3	8.5	3.2	1.5	15.5
L102	50	0.	118.3	934.8	149.0	49.7	1251.8	0.	2.4	18.7	3.0	1.0	25.0
LM02	55	0.	127.4	328.8	165.6	66.3	688.1	0.	2.3	6.0	3.0	1.2	12.5
LM04	32	0.	43.2	312.0	116.0	32.7	503.8	0.	1.4	9.7	3.6	1.0	15.7
OM04	40	0.	58.7	358.6	139.9	29.1	586.2	0.	1.5	9.0	3.5	.7	14.7
RM10	37	0.	52.4	364.7	109.7	40.5	567.3	0.	1.4	9.9	3.0	1.1	15.3
SM10	33	5.5	61.1	206.9	95.7	35.5	404.7	.2	1.9	6.3	2.9	1.1	12.3
VM05	24	1.6	62.8	149.8	81.9	10.9	307.0	.1	2.6	6.2	3.4	.5	12.8
VM15	63	0.	114.5	746.8	202.9	69.1	1133.2	0.	1.8	11.9	3.2	1.1	18.0
WM03	45	0.	120.0	433.9	137.1	75.3	766.3	0.	2.7	9.6	3.0	1.7	17.0
TOTAL	1247	34.0	2796.7	11871.2	3869.6	1925.8	20497.2	.0	2.2	9.5	3.1	1.5	16.4

1979 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
M101	56	2.6	150.5	861.0	164.4	200.7	1379.2	.0	2.7	15.4	2.9	3.6	24.6
M202	55	0.	112.3	384.6	170.2	79.8	746.8	0.	2.0	7.0	3.1	1.5	13.6
M204	19	.2	41.1	117.3	33.3	80.8	272.5	.0	2.2	6.2	1.8	4.3	14.3
M222	57	0.	130.9	727.2	197.4	48.5	1104.0	0.	2.3	12.8	3.5	.8	19.4
M501	28	.3	57.3	362.3	75.6	36.4	531.9	.0	2.0	12.9	2.7	1.3	19.0
M502	31	4.3	60.4	61.2	81.6	42.4	250.0	.1	1.9	2.0	2.6	1.4	8.1
MB04	30	.8	73.7	334.5	85.5	17.5	512.0	.0	2.5	11.2	2.9	.6	17.1
MB12	36	0.	89.7	257.6	118.3	40.8	506.5	0.	2.5	7.2	3.3	1.1	14.1
MB14	30	.8	69.8	447.3	72.0	48.0	638.0	.0	2.3	14.9	2.4	1.6	21.3
MC02	56	.5	112.7	383.8	203.7	44.8	745.5	.0	2.0	6.9	3.6	.8	13.3
MC04	36	.3	78.7	234.1	87.1	122.4	522.5	.0	2.2	6.5	2.4	3.4	14.5
MC06	33	.6	64.3	338.9	111.7	54.5	569.8	.0	1.9	10.3	3.4	1.7	17.3
MC08	20	0.	45.8	36.8	40.7	39.3	162.6	0.	2.3	1.8	2.0	2.0	8.1
MC10	23	.9	53.4	206.6	80.5	0.	341.3	.0	2.3	9.0	3.5	0.	14.8
MD02	21	1.2	49.2	229.3	38.9	71.4	389.9	.1	2.3	10.9	1.9	3.4	18.6
ME02	38	.2	95.8	285.9	97.2	119.1	598.1	.0	2.5	7.5	2.6	3.1	15.7
ME06	46	1.3	104.5	100.2	121.7	177.9	505.4	.0	2.3	2.2	2.6	3.9	11.0
MF04	52	2.5	113.5	780.3	187.6	.9	1084.8	.0	2.2	15.0	3.6	.0	20.9
MH03	20	0.	28.3	51.3	45.7	34.3	159.7	0.	1.4	2.6	2.3	1.7	8.0
MH05	8	0.	16.9	22.5	17.2	23.6	80.3	0.	2.1	2.8	2.2	3.0	10.0
MH07	31	1.6	67.2	183.6	114.5	0.	366.9	.1	2.2	5.9	3.7	0.	11.8
MR02	78	2.3	179.8	663.5	311.1	26.0	1182.6	.0	2.3	8.5	4.0	.3	15.2
MR04	21	1.1	46.7	180.7	37.8	63.4	329.6	.1	2.2	8.6	1.8	3.0	15.7
MR08	55	.7	137.2	637.4	154.0	71.5	1000.8	.0	2.5	11.6	2.8	1.3	18.2
MS02	33	2.7	79.0	388.8	91.2	56.7	618.2	.1	2.4	11.8	2.8	1.7	18.7
MU02	49	2.4	115.3	485.7	138.8	75.1	817.4	.0	2.4	9.9	2.8	1.5	16.7
MV04	67	2.8	158.6	246.3	248.5	130.7	786.8	.0	2.4	3.7	3.7	2.0	11.7
MV08	66	1.9	132.9	553.2	300.7	0.	988.7	.0	2.0	8.4	4.6	0.	15.0
MV10	62	.3	123.9	1097.6	176.3	129.2	1527.3	.0	2.0	17.7	2.8	2.1	24.6
MV12	13	.6	33.9	87.2	24.1	16.7	162.4	.0	2.6	6.7	1.9	1.3	12.5
MW02	55	.4	122.9	944.1	174.3	54.1	1295.7	.0	2.2	17.2	3.2	1.0	23.6
MW04	22	.8	50.6	180.8	68.2	19.8	320.2	.0	2.3	8.2	3.1	.9	14.6
TOTAL	1247	34.0	2796.7	11871.2	3869.6	1925.8	20497.2	.0	2.2	9.5	3.1	1.5	16.4

1979 No Build Madison Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	66	.8	159.5	704.9	190.4	88.8	1144.5	.0	2.4	10.7	2.9	1.3	17.3
BOC	31	1.9	85.6	417.1	85.3	111.1	700.9	.1	2.8	13.5	2.8	3.6	22.6
BOK	25	.7	64.9	444.0	79.2	89.6	678.3	.0	2.6	17.8	3.2	3.6	27.1
BOT	30	1.2	74.4	397.5	100.0	.5	573.6	.0	2.5	13.3	3.3	.0	19.1
CAVE	76	1.4	163.5	582.3	232.8	93.8	1073.8	.0	2.2	7.7	3.1	1.2	14.1
CNW	59	4.7	117.7	423.5	157.2	78.8	781.9	.1	2.0	7.2	2.7	1.3	13.3
CRAN	78	2.3	179.8	663.5	311.1	26.0	1182.6	.0	2.3	8.5	4.0	.3	15.2
CRC	55	.7	137.2	637.4	154.0	71.5	1000.8	.0	2.5	11.6	2.8	1.3	18.2
CRRL	21	1.1	46.7	180.7	37.8	63.4	329.6	.1	2.2	8.6	1.8	3.0	15.7
GCE	28	0.	45.3	73.8	62.9	57.9	239.9	0.	1.6	2.6	2.2	2.1	8.6
GCW	31	1.6	67.2	183.6	114.5	0.	366.9	.1	2.2	5.9	3.7	0.	11.8
IC	129	3.1	282.5	1343.8	424.8	259.8	2314.1	.0	2.2	10.4	3.3	2.0	17.9
ITC	49	2.4	115.3	485.7	138.8	75.1	817.4	.0	2.4	9.9	2.8	1.5	16.7
ITFR	13	.6	33.9	87.2	24.1	16.7	162.4	.0	2.6	6.7	1.9	1.3	12.5
LN	84	1.5	200.3	386.0	218.9	296.9	1103.6	.0	2.4	4.6	2.6	3.5	13.1
MKT	32	.3	71.3	162.0	103.7	25.6	362.8	.0	2.2	5.1	3.2	.8	11.3
MFD	21	1.2	49.2	229.3	38.9	71.4	309.9	.1	2.3	10.9	1.9	3.4	18.6
MFW	19	.2	41.1	117.3	33.3	80.8	272.5	.0	2.2	6.2	1.8	4.3	14.3
MRS	30	.8	73.7	334.5	85.5	17.5	512.0	.0	2.5	11.2	2.9	.6	17.1
NWE	58	1.1	129.3	414.9	155.3	142.2	842.7	.0	2.2	7.2	2.7	2.5	14.5
NWW	55	.4	122.9	944.1	174.3	54.1	1295.7	.0	2.2	17.2	3.2	1.0	23.6
RI	24	.3	41.3	221.9	100.0	19.2	382.6	.0	1.7	9.2	4.2	.8	15.9
SFMS	55	0.	112.3	384.6	170.2	79.8	746.8	0.	2.0	7.0	3.1	1.5	13.6
SFSF	21	0.	47.0	287.4	89.3	17.9	441.5	0.	2.2	13.7	4.3	.8	21.0
SFTU	36	0.	83.9	439.8	108.2	30.6	662.5	0.	2.3	12.2	3.0	.8	18.4
SOU	33	2.7	79.0	388.8	91.2	56.7	618.2	.1	2.4	11.8	2.8	1.7	18.7
SSW	66	1.9	132.9	553.2	300.7	0.	988.7	.0	2.0	8.4	4.6	0.	15.0
WFE	22	1.3	39.1	382.8	87.6	.4	511.1	.1	1.8	17.4	4.0	.0	23.2
TOTAL	1247	34.0	2796.7	11871.2	3869.6	1925.8	20497.2	.0	2.2	9.5	3.1	1.5	16.4

1979 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Time of Day Interval	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	218	15.6	519.5	2300.8	692.9	367.5	3896.2	.1	2.4	10.6	3.2	1.7	17.9
INT-2	230	0.	498.7	1911.1	745.2	327.0	3482.0	0.	2.2	8.3	3.2	1.4	15.1
INT-3	112	3.3	167.2	1318.1	370.0	126.6	1985.2	.0	1.5	11.8	3.3	1.1	17.7
INT-4	333	11.4	805.1	2923.4	983.9	470.0	5193.7	.0	2.4	8.8	3.0	1.4	15.6
INT-5	118	3.7	295.0	1433.9	336.1	234.8	2303.3	.0	2.5	12.2	2.8	2.0	19.5
INT-6	236	0.	511.3	1983.9	741.6	400.1	3636.8	0.	2.2	8.4	3.1	1.7	15.4
TOTAL	1247	34.0	2796.7	11871.2	3869.6	1925.8	20497.2	.0	2.2	9.5	3.1	1.5	16.4

B.11 Detention Time for 1985 No Build Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1985 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	91	0.	209.9	1335.8	316.5	56.6	1918.8	0.	2.3	14.7	3.5	.6	21.1
ITC	120	0.	386.4	1247.4	402.8	220.4	2257.0	0.	3.2	10.4	3.4	1.8	18.8
MP	87	0.	297.1	645.1	317.9	107.9	1368.0	0.	3.4	7.4	3.7	1.2	15.7
NW	51	0.	212.5	651.6	168.3	103.3	1135.7	0.	4.2	12.8	3.3	2.0	22.3
SLSF	57	0.	164.8	607.3	204.2	123.1	1099.4	0.	2.9	10.7	3.6	2.2	19.3
TRRA	1011	32.7	2604.0	8792.3	3552.2	1332.5	16313.6	.0	2.6	8.7	3.5	1.3	16.1
TOTAL	1417	32.7	3874.7	13279.5	4961.8	1943.8	24092.5	.0	2.7	9.4	3.5	1.4	17.0

1985 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	143	2.6	390.1	1174.2	580.1	142.8	2289.7	.0	2.7	8.2	4.1	1.0	16.0
MP	22	1.1	71.2	262.9	57.9	13.6	406.8	.1	3.2	12.0	2.6	.6	18.5
TRRA	1252	29.0	3413.4	11842.5	4323.8	1787.4	21396.0	.0	2.7	9.5	3.5	1.4	17.1
TOTAL	1417	32.7	3874.7	13279.5	4961.8	1943.8	24092.5	.0	2.7	9.4	3.5	1.4	17.0

1985 No Build Madison Yard

Inbound Train	Number of Cars	Aggregate Car Hours: Hold-Out Time	Aggregate Car Hours: Yarding Time	Aggregate Car Hours: Switching Time	Aggregate Car Hours: Make-Up Time	Aggregate Car Hours: Schedule Slack	Aggregate Car Hours: Total Detention Time	Average Car Hours/Car: Hold-Out Time	Average Car Hours/Car: Yarding Time	Average Car Hours/Car: Switching Time	Average Car Hours/Car: Make-Up Time	Average Car Hours/Car: Schedule Slack	Average Car Hours/Car: Total Detention Time
1C05	24	4.8	99.6	158.8	72.1	29.6	364.9	.2	4.2	6.6	3.0	1.2	15.2
2M01	52	0.	165.5	288.5	187.6	48.7	690.2	0.	3.2	5.5	3.6	.9	13.3
2M02	53	4.4	173.4	397.3	193.9	67.9	836.9	.1	3.3	7.5	3.7	1.3	15.8
2M03	36	3.6	62.2	494.1	129.3	57.8	747.0	.1	1.7	13.7	3.6	1.6	20.7
2M05	104	0.	335.6	1281.4	338.1	171.6	2126.7	0.	3.2	12.3	3.3	1.6	20.4
2M07	67	0.	165.3	622.5	229.4	99.0	1116.1	0.	2.5	9.3	3.4	1.5	16.7
2M08	26	0.	97.1	212.6	102.3	25.2	437.3	0.	3.7	8.2	3.9	1.0	16.8
6207	20	0.	47.7	265.3	62.9	31.0	406.9	0.	2.4	13.3	3.1	1.6	20.3
6223	37	0.	117.2	342.1	141.3	92.0	692.5	0.	3.2	9.2	3.8	2.5	18.7
6M01	87	0.	297.1	645.1	317.9	107.9	1368.0	0.	3.4	7.4	3.7	1.2	15.7
7M10	72	0.	308.4	793.3	216.5	120.7	1439.0	0.	4.3	11.0	3.0	1.7	20.0
BM03	6	0.	13.7	42.3	19.5	5.4	80.9	0.	2.3	7.1	3.3	.9	13.5
CM01	43	0.	141.4	593.1	176.2	76.8	987.5	0.	3.3	13.8	4.1	1.8	23.0
CM03	74	0.	155.0	455.1	283.1	96.9	990.0	0.	2.1	6.1	3.8	1.3	13.4
CM07	36	0.	81.6	464.3	129.7	58.6	734.2	0.	2.3	12.9	3.6	1.6	20.4
CM09	37	0.	127.7	711.3	117.2	70.3	1026.3	0.	3.5	19.2	3.2	1.9	27.7
CM19	66	12.1	156.8	591.7	255.9	73.9	1090.3	.2	2.4	9.0	3.9	1.1	16.5
FM11	68	0.	175.7	458.1	247.0	69.1	949.9	0.	2.6	6.7	3.6	1.0	14.0
HM02	67	0.	138.5	292.0	248.3	45.8	724.6	0.	2.1	4.4	3.7	.7	10.8
HM06	14	0.	37.8	111.3	55.5	15.7	220.2	0.	2.7	7.9	4.0	1.1	15.7
L102	54	0.	155.6	995.2	175.9	16.5	1343.2	0.	2.9	18.4	3.3	.3	24.9
LM02	65	0.	148.0	396.3	208.6	62.3	815.1	0.	2.3	6.1	3.2	1.0	12.5
LM04	37	0.	54.3	340.6	140.6	40.1	575.6	0.	1.5	9.2	3.8	1.1	15.6
OM04	48	0.	78.0	454.1	186.2	99.7	818.0	0.	1.6	9.5	3.9	2.1	17.0
RM10	43	0.	65.2	369.1	128.1	93.4	655.8	0.	1.5	8.6	3.0	2.2	15.3
SM10	33	5.5	66.0	18.7	72.6	108.9	271.7	.2	2.0	.6	2.2	3.3	8.2
VM05	27	2.3	62.1	172.6	100.1	7.9	344.9	.1	2.3	6.4	3.7	.3	12.8
VM15	70	0.	136.0	661.5	257.9	47.8	1103.2	0.	1.9	9.4	3.7	.7	15.8
WM03	51	0.	212.5	651.6	168.3	103.3	1135.7	0.	4.2	12.8	3.3	2.0	22.3
TOTAL	1417	32.7	3874.7	13279.5	4961.8	1943.8	24092.5	.0	2.7	9.4	3.5	1.4	17.0

1985 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
M101	67	2.5	215.8	968.2	307.9	156.3	1650.7	.0	3.2	14.5	4.6	2.3	24.6
M202	71	0.	189.4	698.1	290.2	285.2	1462.9	0.	2.7	9.8	4.1	4.0	20.6
M204	22	.1	64.9	137.3	42.9	67.1	312.3	.0	2.9	6.2	2.0	3.1	14.2
M222	63	0.	198.9	829.0	230.1	5.3	1263.2	0.	3.2	13.2	3.7	.1	20.1
M501	39	.3	111.0	473.2	134.9	46.8	766.1	.0	2.8	12.1	3.5	1.2	19.6
M502	33	5.5	66.0	18.7	72.6	108.9	271.7	.2	2.0	.6	2.2	3.3	8.2
MB04	31	.5	99.2	348.8	92.1	0.	540.6	.0	3.2	11.3	3.0	0.	17.4
MB12	36	0.	124.2	239.2	115.7	103.8	582.9	0.	3.5	6.6	3.2	2.9	16.2
MB14	42	1.0	102.0	518.9	132.8	69.3	824.0	.0	2.4	12.4	3.2	1.7	19.6
MC02	63	.7	160.0	695.3	239.5	77.7	1173.2	.0	2.5	11.0	3.8	1.2	18.6
MC04	47	0.	126.4	212.3	177.5	0.	516.2	0.	2.7	4.5	3.8	0.	11.0
MC06	36	.8	90.7	306.8	135.7	43.2	577.2	.0	2.5	8.5	3.8	1.2	16.0
MC08	24	0.	51.7	57.6	64.0	32.0	205.3	0.	2.2	2.4	2.7	1.3	8.6
MC10	26	1.3	56.1	217.1	100.5	3.5	378.6	.1	2.2	8.4	3.9	.1	14.6
MD02	22	1.1	71.2	262.9	57.9	13.6	406.8	.1	3.2	12.0	2.6	.6	18.5
ME02	43	.2	173.1	230.9	109.9	149.1	663.1	.0	4.0	5.4	2.6	3.5	15.4
ME06	51	1.3	112.0	195.7	173.2	68.8	551.1	.0	2.2	3.8	3.4	1.4	10.8
MF04	59	2.3	144.8	775.0	214.9	85.5	1222.5	.0	2.5	13.1	3.6	1.5	20.7
MH03	24	0.	36.4	50.8	47.2	57.2	191.6	0.	1.5	2.1	2.0	2.4	8.0
MH05	10	0.	30.0	33.8	32.3	5.7	101.8	0.	3.0	3.4	3.2	.6	10.2
MH07	38	0.	90.3	197.2	146.3	1.3	435.0	0.	2.4	5.2	3.9	.0	11.4
MR02	80	1.8	212.7	526.8	370.6	69.3	1181.2	.0	2.7	6.6	4.6	.9	14.8
MR04	26	1.1	63.6	266.0	75.0	9.5	416.1	.0	2.4	10.2	2.9	.4	16.0
MR08	63	.7	177.4	647.4	209.5	73.5	1108.5	.0	2.8	10.3	3.3	1.2	17.6
MS02	41	3.2	121.8	405.7	110.1	43.1	683.9	.1	3.0	9.9	2.7	1.1	16.7
MU02	57	1.7	161.4	599.0	179.7	115.9	1057.7	.0	2.8	10.5	3.2	2.0	18.6
MV04	73	3.2	201.9	280.4	301.6	66.9	854.0	.0	2.8	3.8	4.1	.9	11.7
MV08	56	.7	123.3	276.8	223.1	6.5	630.4	.0	2.2	4.9	4.0	.1	11.3
MV10	74	.4	213.3	1285.1	263.4	146.8	1908.9	.0	2.9	17.4	3.6	2.0	25.8
MV12	15	.8	51.1	94.3	30.0	13.3	189.4	.1	3.4	6.3	2.0	.9	12.6
MW02	61	.4	168.0	1073.7	210.0	0.	1452.1	.0	2.8	17.6	3.4	0.	23.8
MW04	24	.9	66.3	357.7	70.0	18.8	513.7	.0	2.8	14.9	2.9	.8	21.4
TOTAL	1417	32.7	3874.7	13279.5	4961.8	1943.8	24092.5	.0	2.7	9.4	3.5	1.4	17.0

1985 No Build Madison Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	78	1.0	226.2	758.1	248.5	173.1	1406.9	.0	2.9	9.7	3.2	2.2	18.0
BOC	37	1.8	121.5	487.7	148.7	86.3	846.0	.0	3.3	13.2	4.0	2.3	22.9
BOK	30	.8	94.3	480.6	159.1	70.0	804.7	.0	3.1	16.0	5.3	2.3	26.8
BOT	36	1.1	102.3	413.4	116.4	52.2	685.4	.0	2.8	11.5	3.2	1.5	19.0
CAVE	86	2.1	198.6	581.5	300.2	78.7	1161.1	.0	2.3	6.8	3.5	.9	13.5
CNW	72	5.8	177.0	491.9	207.5	155.7	1037.8	.1	2.5	6.8	2.9	2.2	14.4
CRAN	80	1.8	212.7	526.8	370.6	69.3	1181.2	.0	2.7	6.6	4.6	.9	14.8
CRC	63	.7	177.4	647.4	209.5	73.5	1108.5	.0	2.8	10.3	3.3	1.2	17.6
CRRL	26	1.1	63.6	266.0	75.8	9.5	416.1	.0	2.4	10.2	2.9	.4	16.0
GCE	34	0.	66.4	84.6	79.5	62.9	293.4	0.	2.0	2.5	2.3	1.8	8.6
GCW	38	0.	90.3	197.2	146.3	1.3	435.0	0.	2.4	5.2	3.9	.0	11.4
IC	147	3.6	415.2	1565.5	565.0	213.7	2762.9	.0	2.8	10.6	3.8	1.5	18.8
ITC	57	1.7	161.4	599.0	179.7	115.9	1057.7	.0	2.8	10.5	3.2	2.0	18.6
ITFR	15	.8	51.1	94.3	30.0	13.3	189.4	.1	3.4	6.3	2.0	.9	12.6
LN	94	1.5	285.1	426.6	283.1	217.9	1214.2	.0	3.0	4.5	3.0	2.3	12.9
MKT	36	.3	107.6	500.1	103.1	44.4	755.5	.0	3.0	13.9	2.9	1.2	21.0
MPD	22	1.1	71.2	262.9	57.9	13.6	406.8	.1	3.2	12.0	2.6	.6	18.5
MPW	22	.1	64.9	137.3	42.9	67.1	312.3	.0	2.9	6.2	2.0	3.1	14.2
MRS	31	.5	99.2	348.8	92.1	0.	540.6	.0	3.2	11.3	3.0	0.	17.4
NWE	71	.9	192.7	569.9	247.5	18.8	1029.9	.0	2.7	8.0	3.5	.3	14.5
NWW	61	.4	168.0	1073.7	210.0	0.	1452.1	.0	2.8	17.6	3.4	0.	23.8
RI	27	.4	52.4	195.2	136.4	33.3	417.6	.0	1.9	7.2	5.0	1.2	15.5
SFMS	71	0.	189.4	698.1	290.2	285.2	1462.9	0.	2.7	9.8	4.1	4.0	20.6
SFSP	22	0.	77.1	343.3	84.0	1.8	506.2	0.	3.5	15.6	3.8	.1	23.0
SFTU	41	0.	121.8	485.7	146.2	3.4	757.0	0.	3.0	11.8	3.6	.1	18.5
SOU	41	3.2	121.8	405.7	110.1	43.1	683.9	.1	3.0	9.9	2.7	1.1	16.7
SSW	56	.7	123.3	276.8	223.1	6.5	630.4	.0	2.2	4.9	4.0	.1	11.3
WFE	23	1.3	42.4	361.6	98.5	33.4	537.1	.1	1.8	15.7	4.3	1.5	23.4
TOTAL	1417	32.7	3874.7	13279.5	4961.8	1943.8	24092.5	.0	2.7	9.4	3.5	1.4	17.0

1985 No Build Madison Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	238	16.5	621.2	2285.8	903.4	271.8	4098.7	.1	2.6	9.6	3.8	1.1	17.2
INT-2	260	0.	597.1	2138.5	915.9	221.6	3873.0	0.	2.3	8.2	3.5	.9	14.9
INT-3	121	3.6	194.5	1288.8	456.1	197.6	2140.6	.0	1.6	10.7	3.8	1.6	17.7
INT-4	388	7.8	1167.7	3530.9	1247.1	674.2	6627.6	.0	3.0	9.1	3.2	1.7	17.1
INT-5	138	4.8	536.8	1734.3	459.9	228.4	2964.2	.0	3.9	12.6	3.3	1.7	21.5
INT-6	272	0.	757.5	2301.3	979.5	350.2	4388.4	0.	2.8	8.5	3.6	1.3	16.1
TOTAL	1417	32.7	3874.7	13279.5	4961.8	1943.8	24092.5	.0	2.7	9.4	3.5	1.4	17.0

B.12 Detention Time for 2000 No Build Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

2000 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	109	0.	199.5	859.4	410.6	53.5	1523.0	0.	1.8	7.9	3.8	.5	14.0
ITC	154	0.	401.3	986.0	579.7	118.7	2085.6	0.	2.6	6.4	3.8	.8	13.5
MP	104	57.2	283.4	883.6	383.7	125.7	1733.6	.6	2.7	8.5	3.7	1.2	16.7
NW	69	0.	235.8	474.2	270.4	41.6	1021.9	0.	3.4	6.9	3.9	.6	14.8
SLSF	82	0.	225.6	631.0	271.9	123.9	1252.4	0.	2.8	7.7	3.3	1.5	15.3
TRRA	1106	112.8	2680.6	8686.8	3969.9	1382.1	16832.0	.1	2.4	7.9	3.6	1.2	15.2
TOTAL	1624	170.0	4026.0	12521.0	5886.2	1845.4	24448.5	.1	2.5	7.7	3.6	1.1	15.1

2000 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	99	17.8	242.8	1077.6	301.1	154.4	1793.7	.2	2.5	10.9	3.0	1.6	18.1
MP	33	4.7	90.9	308.7	65.5	116.0	585.7	.1	2.8	9.4	2.0	3.5	17.7
TRRA	1492	147.5	3692.4	11134.7	5519.6	1575.0	22069.1	.1	2.5	7.5	3.7	1.1	14.8
TOTAL	1624	170.0	4026.0	12521.0	5886.2	1845.4	24448.5	.1	2.5	7.7	3.6	1.1	15.1

2000 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
1C05	36	4.8	117.6	256.4	126.5	66.8	572.1	.1	3.3	7.1	3.5	1.9	15.9
2M01	99	82.5	309.2	1189.7	335.6	206.3	2123.4	.8	3.1	12.0	3.4	2.1	21.4
2M02	72	0.	127.2	382.8	313.5	43.5	867.0	0.	1.8	5.3	4.4	.6	12.0
2M03	105	21.0	270.1	1162.4	405.7	105.8	1965.0	.2	2.6	11.1	3.9	1.0	18.7
2M05	129	0.	363.6	1411.7	439.0	185.9	2400.2	0.	2.8	10.9	3.4	1.4	18.6
2M07	105	0.	244.9	944.2	349.1	169.6	1707.7	0.	2.3	9.0	3.3	1.6	16.3
2M08	46	0.	138.0	332.1	160.0	62.6	692.7	0.	3.0	7.2	3.5	1.4	15.1
6207	20	0.	41.7	193.2	51.4	50.4	336.8	0.	2.1	9.7	2.6	2.5	16.8
6223	62	0.	183.9	437.8	220.5	73.4	915.7	0.	3.0	7.1	3.6	1.2	14.8
6M01	104	57.2	283.4	883.6	383.7	125.7	1733.6	.6	2.7	8.5	3.7	1.2	16.7
7M10	113	0.	350.7	879.3	418.1	83.5	1731.6	0.	3.1	7.8	3.7	.7	15.3
RM03	9	0.	19.5	42.4	39.7	6.4	107.8	0.	2.2	4.7	4.4	.7	12.0
FM11	113	0.	303.5	737.9	444.2	82.0	1567.6	0.	2.7	6.5	3.9	.7	13.9
HM02	86	0.	186.1	342.5	250.6	128.9	908.1	0.	2.2	4.0	2.9	1.5	10.6
HM06	22	0.	50.6	187.9	97.7	24.9	361.1	0.	2.3	8.5	4.4	1.1	16.4
L102	62	0.	121.9	523.7	193.7	23.8	863.2	0.	2.0	8.4	3.1	.4	13.9
LM02	68	0.	112.2	440.4	234.9	58.7	846.2	0.	1.7	6.5	3.5	.9	12.4
LM04	47	0.	77.5	335.7	216.9	29.7	659.8	0.	1.7	7.1	4.6	.6	14.0
OM04	41	0.	50.6	106.7	161.6	35.2	354.0	0.	1.2	2.6	3.9	.9	8.6
OM06	33	3.9	36.9	216.0	117.9	78.0	452.6	.1	1.1	6.5	3.6	2.4	13.7
RM10	34	0.	50.4	65.5	89.7	79.0	284.6	0.	1.5	1.9	2.6	2.3	8.4
SM10	6	.6	11.2	2.7	14.3	.1	28.9	.1	1.9	.5	2.4	.0	4.8
VM05	41	0.	84.0	264.0	198.4	0.	546.5	0.	2.1	6.4	4.8	0.	13.3
VM15	102	0.	255.5	708.3	353.2	83.6	1400.6	0.	2.5	6.9	3.5	.8	13.7
WM03	69	0.	235.8	474.2	270.4	41.6	1021.9	0.	3.4	6.9	3.9	.6	14.8
TOTAL	1624	170.0	4026.0	12521.0	5886.2	1845.4	24448.5	.1	2.5	7.7	3.6	1.1	15.1

2000 No Build Madison Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
M101	63	25.7	188.2	457.5	264.0	1.1	936.3	.4	3.0	7.3	4.2	.0	14.9
M202	73	.2	211.2	585.7	304.4	17.0	1118.6	.0	2.9	8.0	4.2	.2	15.3
M204	32	3.6	83.4	142.3	60.3	115.7	405.3	.1	2.6	4.4	1.9	3.6	12.7
M222	63	0.	96.6	338.7	218.2	59.9	713.4	0.	1.5	5.4	3.5	1.0	11.3
M224	45	0.	141.3	161.1	131.3	99.8	533.4	0.	3.1	3.6	2.9	2.2	11.9
M501	28	0.	65.1	257.1	95.7	43.4	461.3	0.	2.3	9.2	3.4	1.6	16.5
M502	26	.8	60.1	202.9	57.2	52.0	373.0	.0	2.3	7.8	2.2	2.0	14.3
MB04	40	5.8	109.3	426.4	186.9	0.	728.4	.1	2.7	10.7	4.7	0.	18.2
MB12	70	0.	205.3	443.5	284.7	0.	933.5	0.	2.9	6.3	4.1	0.	13.3
MB14	53	1.6	158.7	805.1	155.4	98.9	1219.8	.0	3.0	15.2	2.9	1.9	23.0
MC02	86	1.2	192.9	446.5	416.6	0.	1057.3	.0	2.2	5.2	4.8	0.	12.3
MC04	71	9.2	179.4	440.8	230.2	140.8	1000.4	.1	2.5	6.2	3.2	2.0	14.1
MC06	39	.8	112.4	97.3	149.5	10.4	370.4	.0	2.9	2.5	3.8	.3	9.5
MC08	58	0.	137.7	227.4	171.7	55.1	591.9	0.	2.4	3.9	3.0	1.0	10.2
MC10	61	7.2	147.8	346.6	278.1	0.	779.8	.1	2.4	5.7	4.6	0.	12.8
MD02	33	4.7	90.9	308.7	65.5	116.0	585.7	.1	2.8	9.4	2.0	3.5	17.7
ME02	64	.8	208.9	486.7	307.8	10.7	1014.9	.0	3.3	7.6	4.8	.2	15.9
ME06	4	0.	8.9	18.9	5.9	11.6	45.4	0.	2.2	4.7	1.5	2.9	11.4
MF04	43	10.5	111.7	576.8	141.6	63.8	904.4	.2	2.6	13.4	3.3	1.5	21.0
MH03	31	0.	46.0	48.0	75.0	78.5	247.5	0.	1.5	1.5	2.4	2.5	8.0
MH05	16	0.	44.5	49.9	59.5	12.8	166.6	0.	2.8	3.1	3.7	.8	10.4
MH07	61	28.6	132.2	866.0	206.3	152.5	1385.6	.5	2.2	14.2	3.4	2.5	22.7
MR02	59	10.1	144.7	676.5	199.2	17.7	1048.1	.2	2.5	11.5	3.4	.3	17.8
MR04	31	0.	71.0	96.4	105.1	9.8	282.3	0.	2.3	3.1	3.4	.3	9.1
MR08	40	7.7	98.1	401.1	102.0	136.7	745.6	.2	2.5	10.0	2.5	3.4	18.6
MS02	63	2.0	142.0	447.5	215.2	49.4	856.0	.0	2.3	7.1	3.4	.8	13.6
MU02	80	17.7	216.2	651.1	268.6	350.7	1504.3	.2	2.7	8.1	3.4	4.4	18.8
MV04	78	18.2	185.4	593.7	412.1	18.2	1227.4	.2	2.4	7.6	5.3	.2	15.7
MV08	65	.6	134.1	739.6	220.6	1.1	1096.0	.0	2.1	11.4	3.4	.0	16.9
MV10	8	1.2	17.3	23.1	14.8	33.2	89.6	.2	2.2	2.9	1.9	4.2	11.2
MV12	20	8.5	53.2	97.3	43.7	52.3	255.0	.4	2.7	4.9	2.2	2.6	12.7
MW02	81	3.3	162.9	742.5	295.4	0.	1204.1	.0	2.0	9.2	3.6	0.	14.9
MW04	39	0.	68.8	318.3	144.0	36.4	567.5	0.	1.8	8.2	3.7	.9	14.6
TOTAL	1624	170.0	4026.0	12521.0	5886.2	1845.4	24448.5	.1	2.5	7.7	3.6	1.1	15.1

2000 No Build Madison Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	123	1.6	364.0	1248.6	440.1	98.9	2153.2	.0	3.0	10.2	3.6	.8	17.5
BOC	33	21.6	114.2	244.8	117.0	.6	498.1	.7	3.5	7.4	3.5	.0	15.1
BOK	30	4.1	74.0	212.7	147.0	.5	438.2	.1	2.5	7.1	4.9	.0	14.6
BOT	43	10.5	111.7	576.8	141.6	63.8	904.4	.2	2.6	13.4	3.3	1.5	21.0
CAVE	158	8.0	397.9	671.3	599.3	65.5	1742.0	.1	2.5	4.2	3.8	.4	11.0
CNW	54	.8	125.2	460.1	152.9	95.4	834.3	.0	2.3	8.5	2.8	1.8	15.4
CRAN	59	10.1	144.7	676.5	199.2	17.7	1048.1	.2	2.5	11.5	3.4	.3	17.8
CRC	40	7.7	98.1	401.1	102.0	136.7	745.6	.2	2.5	10.0	2.5	3.4	18.6
CRRL	31	0.	71.0	96.4	105.1	9.8	282.3	0.	2.3	3.1	3.4	.3	9.1
GCE	47	0.	90.4	97.8	134.5	91.3	414.1	0.	1.9	2.1	2.9	1.9	8.8
GCW	61	28.6	132.2	866.0	206.3	152.5	1385.6	.5	2.2	14.2	3.4	2.5	22.7
IC	86	19.4	202.7	616.8	426.9	51.4	1317.1	.2	2.4	7.2	5.0	.6	15.3
ITC	80	17.7	216.2	651.1	268.6	350.7	1504.3	.2	2.7	8.1	3.4	4.4	18.8
ITFR	20	8.5	53.2	97.3	43.7	52.3	255.0	.4	2.7	4.9	2.2	2.6	12.7
LN	68	.8	217.9	505.6	313.7	22.3	1060.3	.0	3.2	7.4	4.6	.3	15.6
MKT	49	0.	119.5	252.3	190.7	0.	562.4	0.	2.4	5.1	3.9	0.	11.5
MPD	33	4.7	90.9	308.7	65.5	116.0	585.7	.1	2.8	9.4	2.0	3.5	17.7
MPW	32	3.6	83.4	142.3	60.3	115.7	405.3	.1	2.6	4.4	1.9	3.6	12.7
MRS	40	5.8	109.3	426.4	186.9	0.	728.4	.1	2.7	10.7	4.7	0.	18.2
NWE	110	9.2	248.3	759.1	374.2	177.2	1567.9	.1	2.3	6.9	3.4	1.6	14.3
NWW	81	3.3	162.9	742.5	295.4	0.	1204.1	.0	2.0	9.2	3.6	0.	14.9
RI	37	1.2	73.4	194.3	226.0	0.	494.9	.0	2.0	5.3	6.1	0.	13.4
SFMS	108	0.	237.8	499.8	349.5	159.6	1246.7	0.	2.2	4.6	3.2	1.5	11.5
SFO	13	.2	34.8	183.0	61.1	3.0	282.2	.0	2.7	14.1	4.7	.2	21.7
SFSP	20	0.	59.5	210.0	92.0	4.7	366.2	0.	3.0	10.5	4.6	.2	18.3
SFTU	40	0.	117.0	192.7	151.3	9.3	470.2	0.	2.9	4.8	3.8	.2	11.8
SOU	63	2.0	142.0	447.5	215.2	49.4	856.0	.0	2.3	7.1	3.4	.8	13.6
SSW	65	.6	134.1	739.6	220.6	1.1	1096.0	.0	2.1	11.4	3.4	.0	16.9
TOTAL	1624	170.0	4026.0	12521.0	5886.2	1845.4	24448.5	.1	2.5	7.7	3.6	1.1	15.1

2000 No Build Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Time of Day Interval	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	183	0.	402.2	1133.5	706.3	133.5	2375.5	0.	2.2	6.2	3.9	.7	13.0
INT-2	216	0.	420.3	1306.6	679.2	211.5	2617.5	0.	1.9	6.0	3.1	1.0	12.1
INT-3	226	24.9	435.1	1820.8	902.1	248.6	3431.4	.1	1.9	8.1	4.0	1.1	15.2
INT-4	504	83.1	1394.8	4443.9	1767.0	678.7	8367.5	.2	2.8	8.8	3.5	1.3	16.6
INT-5	151	4.8	491.4	1062.6	556.9	171.0	2286.7	.0	3.3	7.0	3.7	1.1	15.1
INT-6	344	57.2	882.4	2753.6	1274.7	402.2	5370.0	.2	2.6	8.0	3.7	1.2	15.6
TOTAL	1624	170.0	4026.0	12521.0	5886.2	1845.4	24448.5	.1	2.5	7.7	3.6	1.1	15.1

B.13 Detention Time for 1985 Two-Yard Directional Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1985 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	381	34.1	779.1	2823.5	1286.8	511.3	5434.8	.1	2.0	7.4	3.4	1.3	14.3
BO	234	0.	708.3	878.3	802.4	345.9	2734.8	0.	3.0	3.8	3.4	1.5	11.7
CR	416	36.1	984.8	3038.8	1426.8	593.5	6080.1	.1	2.4	7.3	3.4	1.4	14.6
ICG	102	0.	229.5	610.2	303.6	194.1	1337.4	0.	2.3	6.0	3.0	1.9	13.1
ITC	51	0.	89.3	487.4	152.3	82.4	811.3	0.	1.8	9.6	3.0	1.6	15.9
LN	104	0.	286.0	811.4	368.5	133.7	1599.5	0.	2.8	7.8	3.5	1.3	15.4
MP	98	0.	258.1	522.7	290.5	192.8	1264.0	0.	2.6	5.3	3.0	2.0	12.9
NW	253	4.0	653.6	2313.8	789.6	405.3	4166.4	.0	2.6	9.1	3.1	1.6	16.5
TOFC	5	0.	3.8	89.2	19.0	0.	112.1	0.	.8	17.8	3.8	0.	22.4
TRRA	410	7.5	811.9	3696.8	1242.8	807.2	6566.1	.0	2.0	9.0	3.0	2.0	16.0
TOTAL	2054	81.7	4804.3	15272.1	6682.3	3266.2	30106.5	.0	2.3	7.4	3.3	1.6	14.7

2000 Three-Yard Bidirectional Gateway Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
GN14	75	14.0	222.0	580.9	371.3	3.8	1191.9	.2	3.0	7.7	5.0	.1	15.9
GN22	90	30.0	393.3	640.8	499.5	0.	1563.6	.3	4.4	7.1	5.6	0.	17.4
GP11	50	30.2	176.1	286.7	170.8	0.	663.8	.6	3.5	5.7	3.4	0.	13.3
GP22	31	.5	101.3	235.6	118.3	25.8	481.5	.0	3.3	7.6	3.8	.8	15.5
GV17	70	21.1	258.9	546.2	333.7	0.	1160.0	.3	3.7	7.8	4.8	0.	16.6
GV27	22	3.4	82.9	97.8	55.7	31.9	271.7	.2	3.8	4.4	2.5	1.5	12.4
GW17	41	9.5	187.5	695.6	166.1	0.	1058.6	.2	4.6	17.0	4.1	0.	25.8
R401	97	5.7	362.9	1249.6	596.6	0.	2214.7	.1	3.7	12.9	6.1	0.	22.8
R405	142	6.7	511.3	940.0	891.9	0.	2349.9	.0	3.6	6.6	6.3	0.	16.5
R407	125	14.7	448.2	1067.5	808.9	0.	2339.4	.1	3.6	8.5	6.5	0.	18.7
R411	126	10.7	442.0	1654.4	775.8	0.	2882.8	.1	3.5	13.1	6.2	0.	22.9
RL01	31	1.5	132.3	452.2	74.9	49.1	710.1	.0	4.3	14.6	2.4	1.6	22.9
S-05	47	12.5	138.7	514.4	151.2	36.0	852.7	.3	3.0	10.9	3.2	.8	18.1
S-81	62	1.6	250.4	407.2	228.4	34.1	921.7	.0	4.0	6.6	3.7	.6	14.9
S-83	38	12.6	96.9	475.5	119.1	70.9	774.9	.3	2.5	12.5	3.1	1.9	20.4
VX02	4	1.7	20.4	7.7	6.8	10.7	47.3	.4	5.1	1.9	1.7	2.7	11.8
VX14	45	2.4	127.5	359.4	222.8	2.3	714.3	.1	2.8	8.0	5.0	.1	15.9
VX92	107	13.5	424.4	386.2	611.7	0.	1435.7	.1	4.0	3.6	5.7	0.	13.4
TOTAL	3262	732.5	12082.0	32900.1	15551.4	1082.3	62348.2	.2	3.7	10.1	4.8	.3	19.1

1985 Two-Yard Directional Madison Yard

Outbound Road	Number of Cars	Hold-Out Time	Aggregate Car Hours Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Average Car Hours/Car Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CRIP	67	4.2	156.9	614.0	236.4	8.9	1020.4	.1	2.3	9.2	3.5	.1	15.2
ICG	29	.6	59.4	315.3	72.0	68.6	516.0	.0	2.0	10.9	2.5	2.4	17.8
MKT	78	3.9	163.8	777.2	329.3	0.	1274.1	.1	2.1	10.0	4.2	0.	16.3
MP	44	1.1	116.5	669.7	135.7	86.5	1009.4	.0	2.6	15.2	3.1	2.0	22.9
NW	61	1.0	127.7	564.5	200.5	89.5	983.1	.0	2.1	9.3	3.3	1.5	16.1
SLSF	416	11.9	842.1	2940.8	1211.6	911.4	5917.8	.0	2.0	7.1	2.9	2.2	14.2
SSW	164	8.6	430.0	547.7	479.6	345.6	1811.5	.1	2.6	3.3	2.9	2.1	11.0
TRRA	1195	50.4	2908.0	8843.0	4017.3	1755.6	17574.2	.0	2.4	7.4	3.4	1.5	14.7
TOTAL	2054	81.7	4804.3	15272.1	6682.3	3266.2	30106.5	.0	2.3	7.4	3.3	1.6	14.7

1985 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-L02	98	0.	258.1	522.7	290.5	192.8	1264.0	0.	2.6	5.3	3.0	2.0	12.9
4E04	24	0.	41.6	48.0	79.5	42.3	211.5	0.	1.7	2.0	3.3	1.8	8.8
4G04	107	0.	337.1	220.0	360.4	171.3	1088.7	0.	3.2	2.1	3.4	1.6	10.2
4Q04	103	0.	329.6	610.3	362.5	132.3	1434.7	0.	3.2	5.9	3.5	1.3	13.9
4R04	39	0.	50.1	371.2	112.1	57.8	591.1	0.	1.3	9.5	2.9	1.5	15.2
4R06	12	0.	15.8	158.4	25.6	5.4	205.2	0.	1.3	13.2	2.1	.5	17.1
7M10	51	0.	89.3	487.4	152.3	82.4	811.3	0.	1.8	9.6	3.0	1.6	15.9
BM01	34	0.	41.4	107.2	84.3	85.7	318.6	0.	1.2	3.2	2.5	2.5	9.4
BM07	52	0.	119.6	831.2	180.4	110.4	1241.6	0.	2.3	16.0	3.5	2.1	23.9
CM03	87	0.	175.5	543.4	250.6	185.1	1154.6	0.	2.0	6.2	2.9	2.1	13.3
CM05	12	0.	10.6	78.1	36.5	21.5	146.8	0.	.9	6.5	3.0	1.8	12.2
CM19	46	1.5	106.6	261.1	128.8	88.0	586.0	.0	2.3	5.7	2.8	1.9	12.7
DM03	34	0.	41.4	418.3	98.5	58.7	616.9	0.	1.2	12.3	2.9	1.7	18.1
EF04	104	0.	286.0	811.4	368.5	133.7	1599.5	0.	2.8	7.8	3.5	1.3	15.4
FM11	21	5.3	37.1	339.1	79.2	8.2	468.9	.3	1.8	16.1	3.8	.4	22.3
GM01	56	11.2	121.3	640.6	165.6	55.7	994.4	.2	2.2	11.4	3.0	1.0	17.8
GM03	61	5.1	144.4	615.9	168.0	76.7	1010.0	.1	2.4	10.1	2.8	1.3	16.6
GM05	44	0.	99.0	402.1	161.1	105.8	768.0	0.	2.3	9.1	3.7	2.4	17.5
GM07	51	0.	74.8	262.9	205.1	53.0	595.8	0.	1.5	5.2	4.0	1.0	11.7
GM09	75	10.0	137.5	314.5	224.6	139.2	825.8	.1	1.8	4.2	3.0	1.9	11.0
GM11	94	7.8	202.1	587.6	362.3	80.9	1240.7	.1	2.2	6.3	3.9	.9	13.2
HM06	14	.7	23.6	150.6	45.9	24.2	244.9	.0	1.7	10.8	3.3	1.7	17.5
L102	122	0.	311.1	756.8	475.5	185.8	1729.2	0.	2.6	6.2	3.9	1.5	14.2
LG92	171	0.	511.7	1644.6	541.3	242.4	2940.0	0.	3.0	9.6	3.2	1.4	17.2
LM04	103	0.	290.1	519.5	362.1	99.3	1271.0	0.	2.8	5.0	3.5	1.0	12.3
LR02	22	6.6	22.7	229.3	63.4	36.5	358.4	.3	1.0	10.4	2.9	1.7	16.3
LR04	118	29.5	295.0	1003.7	388.2	208.7	1925.1	.3	2.5	8.5	3.3	1.8	16.3
TM37	5	0.	3.8	89.2	19.0	0.	112.1	0.	.8	17.8	3.8	0.	22.4
VM04	102	0.	229.5	610.2	303.6	194.1	1337.4	0.	2.3	6.0	3.0	1.9	13.1
VM10	87	0.	223.3	802.5	269.5	176.6	1471.9	0.	2.6	9.2	3.1	2.0	16.9
WM03	48	4.0	90.4	472.9	151.0	80.3	798.5	.1	1.9	9.9	3.1	1.7	16.6
WM05	34	0.	51.6	196.4	97.4	82.6	427.9	0.	1.5	5.8	2.9	2.4	12.6
XM01	23	0.	33.0	165.4	68.9	48.8	316.1	0.	1.4	7.2	3.0	2.1	13.7
TOTAL	2054	81.7	4804.3	15272.1	6682.3	3266.2	30106.5	.0	2.3	7.4	3.3	1.6	14.7

1985 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2618	53	.5	132.6	539.4	179.3	90.1	941.9	.0	2.5	10.2	3.4	1.7	17.8
2622	42	1.1	76.6	194.4	105.7	106.4	484.1	.0	1.8	4.6	2.5	2.5	11.5
2624	40	.7	58.5	123.4	94.0	106.0	382.6	.0	1.5	3.1	2.4	2.7	9.6
2626	38	2.1	70.7	515.5	97.5	92.5	778.3	.1	1.9	13.6	2.6	2.4	20.5
2628	66	5.7	118.5	150.3	208.8	115.5	598.8	.1	1.8	2.3	3.2	1.8	9.1
2630	19	0.	37.2	298.7	36.1	58.9	430.9	0.	2.0	15.7	1.9	3.1	22.7
2632	21	.4	54.9	147.5	42.4	62.7	307.8	.0	2.6	7.0	2.0	3.0	14.7
2636	18	.5	47.9	130.3	40.5	43.5	262.7	.0	2.7	7.2	2.3	2.4	14.6
2674	58	0.	111.9	140.6	191.4	98.6	542.5	0.	1.9	2.4	3.3	1.7	9.4
2676	61	1.0	133.4	700.8	215.9	137.3	1188.3	.0	2.2	11.5	3.5	2.3	19.5
C-92	67	4.2	156.9	614.0	236.4	8.9	1020.4	.1	2.3	9.2	3.5	.1	15.2
K-02	78	3.9	163.8	777.2	329.3	0.	1274.1	.1	2.1	10.0	4.2	0.	16.3
M202	50	1.1	127.5	418.0	146.8	97.5	790.9	.0	2.5	8.4	2.9	2.0	15.8
M206	41	0.	117.0	204.1	125.7	77.9	524.7	0.	2.9	5.0	3.1	1.9	12.8
M703	15	1.2	38.1	105.9	33.5	34.8	213.4	.1	2.5	7.1	2.2	2.3	14.2
MB04	94	3.6	208.2	770.5	359.2	253.8	1595.3	.0	2.2	8.2	3.8	2.7	17.0
MB14	30	1.5	67.7	442.4	63.0	79.5	654.0	.1	2.3	14.7	2.1	2.7	21.8
MC06	45	0.	97.4	510.6	137.3	119.3	864.5	0.	2.2	11.3	3.1	2.7	19.2
MC08	49	1.6	103.8	479.7	126.7	105.3	817.2	.0	2.1	9.8	2.6	2.2	16.7
MC10	33	1.1	83.4	120.5	82.0	72.6	359.6	.0	2.5	3.7	2.5	2.2	10.9
MC12	40	.6	92.1	131.5	107.3	64.0	395.5	.0	2.3	3.3	2.7	1.6	9.9
MD02	44	1.1	116.5	669.7	135.7	86.5	1009.4	.0	2.6	15.2	3.1	2.0	22.9
MD04	88	0.	272.4	509.2	341.4	32.3	1155.2	0.	3.1	5.8	3.9	.4	13.1
MF04	14	3.0	33.2	287.7	39.2	27.1	390.2	.2	2.4	20.6	2.8	1.9	27.9
MG02	49	6.5	76.6	316.2	160.9	83.3	643.5	.1	1.6	6.5	3.3	1.7	13.1
MG06	41	1.5	101.9	274.3	120.3	88.2	586.1	.0	2.5	6.7	2.9	2.2	14.3
MH01	60	.3	160.9	212.6	182.6	125.0	681.4	.0	2.7	3.5	3.0	2.1	11.4
MH03	95	0.	254.9	495.4	381.6	117.2	1249.0	0.	2.7	5.2	4.0	1.2	13.1
MH05	78	5.7	154.9	367.3	303.9	27.3	859.0	.1	2.0	4.7	3.9	.4	11.0
MH07	70	6.0	149.3	180.1	287.7	0.	623.1	.1	2.1	2.6	4.1	0.	8.9
MH09	38	5.5	85.9	787.8	91.8	13.3	984.4	.1	2.3	20.7	2.4	.4	25.9
MM02	12	0.	15.8	158.4	25.6	5.4	205.2	0.	1.3	13.2	2.1	.5	17.1
MT38	24	5.6	59.4	417.0	70.0	50.0	601.9	.2	2.5	17.4	2.9	2.1	25.1

1985 Two-Yard Directional Madison Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
MV10	33	.7	88.7	334.0	89.1	52.8	565.2	.0	2.7	10.1	2.7	1.6	17.1
MW02	54	0.	149.2	921.6	232.6	19.8	1323.2	0.	2.8	17.1	4.3	.4	24.5
MW06	68	0.	180.2	119.6	251.6	114.5	665.8	0.	2.7	1.8	3.7	1.7	9.8
MX08	74	5.2	189.7	278.7	257.6	95.0	826.2	.1	2.6	3.8	3.5	1.3	11.2
VA03	29	.6	59.4	315.3	72.0	68.6	516.0	.0	2.0	10.9	2.5	2.4	17.8
VX02	39	1.6	86.2	279.8	96.2	100.8	564.6	.0	2.2	7.2	2.5	2.6	14.5
VX14	60	0.	189.0	46.0	196.0	104.0	535.0	0.	3.2	.8	3.3	1.7	8.9
VX92	65	7.0	154.8	221.9	187.4	140.8	712.0	.1	2.4	3.4	2.9	2.2	11.0
WL03	61	1.0	127.7	564.5	200.5	89.5	983.1	.0	2.1	9.3	3.3	1.5	16.1
TOTAL	2054	81.7	4804.3	15272.1	6682.3	3266.2	30106.5	.0	2.3	7.4	3.3	1.6	14.7

1985 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	94	3.6	208.2	770.5	359.2	253.8	1595.3	.0	2.2	8.2	3.8	2.7	17.0
CAVE	118	1.7	272.9	762.6	326.5	255.9	1619.5	.0	2.3	6.5	2.8	2.2	13.7
GATE	90	8.0	178.6	590.5	281.2	171.5	1229.6	.1	2.0	6.6	3.1	1.9	13.7
GCE	303	12.0	720.0	1255.3	1155.7	269.5	3412.5	.0	2.4	4.1	3.8	.9	11.3
GCW	38	5.5	85.9	787.8	91.8	13.3	984.4	.1	2.3	20.7	2.4	.4	25.9
IC	33	.7	88.7	334.0	89.1	52.8	565.2	.0	2.7	10.1	2.7	1.6	17.1
ICCH	29	.6	59.4	315.3	72.0	68.6	516.0	.0	2.0	10.9	2.5	2.4	17.8
ITC	15	1.2	38.1	105.9	33.5	34.8	213.4	.1	2.5	7.1	2.2	2.3	14.2
ITFR	12	0.	15.8	158.4	25.6	5.4	205.2	0.	1.3	13.2	2.1	.5	17.1
KTDA	20	1.9	47.6	214.8	110.0	0.	374.3	.1	2.4	10.7	5.5	0.	18.7
KTHO	21	1.6	39.0	303.9	90.3	0.	434.8	.1	1.9	14.5	4.3	0.	20.7
KTKL	15	.3	28.1	43.3	61.5	0.	133.1	.0	1.9	2.9	4.1	0.	8.9
KTFK	22	.2	49.1	215.3	67.5	0.	332.0	.0	2.2	9.8	3.1	0.	15.1
MFD	132	1.1	388.8	1178.9	477.0	118.8	2164.6	.0	2.9	8.9	3.6	.9	16.4
MPW	91	1.1	244.4	622.1	272.6	175.4	1315.6	.0	2.7	6.8	3.0	1.9	14.5
MRS	30	1.5	67.7	442.4	63.0	79.5	654.0	.1	2.3	14.7	2.1	2.7	21.8
NWBE	20	.4	42.6	166.6	84.0	29.3	322.9	.0	2.1	8.3	4.2	1.5	16.1
NWDK	23	.3	54.0	217.5	66.7	33.7	372.3	.0	2.3	9.5	2.9	1.5	16.2
NWDT	49	1.6	103.8	479.7	126.7	105.3	817.2	.0	2.1	9.8	2.6	2.2	16.7
NWSC	18	.3	31.1	180.3	49.8	26.4	288.0	.0	1.7	10.0	2.8	1.5	16.0
NWW	122	0.	329.4	1041.2	484.2	134.3	1989.0	0.	2.7	8.5	4.0	1.1	16.3
RI	67	4.2	156.9	614.0	236.4	8.9	1020.4	.1	2.3	9.2	3.5	.1	15.2
SFBL	25	1.7	44.7	282.6	64.2	60.8	454.1	.1	1.8	11.3	2.6	2.4	18.2
SFCU	19	0.	37.2	298.7	36.1	58.9	430.9	0.	2.0	15.7	1.9	3.1	22.7
SFLD	13	.3	26.0	232.9	33.4	31.6	324.2	.0	2.0	17.9	2.6	2.4	24.9
SFMS	238	7.2	496.3	1531.1	795.4	441.5	3271.5	.0	2.1	6.4	3.3	1.9	13.7
SFSP	61	1.1	113.4	270.9	136.4	168.7	690.3	.0	1.9	4.4	2.2	2.8	11.3
SFTU	60	1.6	124.5	324.7	146.2	149.9	746.8	.0	2.1	5.4	2.4	2.5	12.4
SSW	238	13.8	619.7	826.4	737.3	440.6	2637.7	.1	2.6	3.5	3.1	1.9	11.1
TOFC	24	5.6	59.4	417.0	70.0	50.0	601.9	.2	2.5	17.4	2.9	2.1	25.1
WFE	14	3.0	33.2	287.7	39.2	27.1	390.2	.2	2.4	20.6	2.8	1.9	27.9
TOTAL	2054	81.7	4804.3	15272.1	6682.3	3266.2	30106.5	.0	2.3	7.4	3.3	1.6	14.7

1985 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Time of Day Interval	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	292	0.	728.5	2295.2	876.2	513.3	4413.2	0.	2.5	7.9	3.0	1.8	15.1
INT-2	406	11.2	1044.4	2616.2	1368.4	672.0	5712.2	.0	2.6	6.4	3.4	1.7	14.1
INT-3	503	5.1	1349.5	3498.0	1650.1	693.4	7196.1	.0	2.7	7.0	3.3	1.4	14.3
INT-4	213	29.5	483.3	1893.2	701.5	397.0	3504.4	.1	2.3	8.9	3.3	1.9	16.5
INT-5	398	20.6	742.5	3005.3	1269.8	682.7	5720.9	.1	1.9	7.6	3.2	1.7	14.4
INT-6	242	15.3	456.2	1964.1	816.3	307.9	3559.8	.1	1.9	8.1	3.4	1.3	14.7
TOTAL	2054	81.7	4804.3	15272.1	6682.3	3266.2	30106.5	.0	2.3	7.4	3.3	1.6	14.7

B.14 Detention Time for 2000 Two-Yard Directional Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

2000 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	501	58.3	1784.1	4474.4	1777.5	1033.8	9128.0	.1	3.6	8.9	3.5	2.1	18.2
BO	229	0.	755.7	1603.7	849.2	406.5	3615.2	0.	3.3	7.0	3.7	1.8	15.8
CR	566	51.9	1928.5	3882.6	1997.2	728.1	8588.2	.1	3.4	6.9	3.5	1.3	15.2
ICG	177	0.	532.4	1086.5	519.5	364.4	2502.8	0.	3.0	6.1	2.9	2.1	14.1
ITC	46	0.	154.9	576.0	170.6	59.1	960.6	0.	3.4	12.5	3.7	1.3	20.9
LN	126	0.	522.1	1709.6	365.3	201.9	2798.8	0.	4.1	13.6	2.9	1.6	22.2
MP	102	0.	382.5	910.4	304.4	192.2	1789.4	0.	3.8	8.9	3.0	1.9	17.5
NW	217	6.3	518.6	1368.1	712.8	505.5	3111.3	.0	2.4	6.3	3.3	2.3	14.3
TOFC	6	0.	13.3	85.6	26.8	7.6	133.3	0.	2.2	14.3	4.5	1.3	22.2
TRRA	511	10.2	1397.8	5037.8	1781.1	972.4	9199.2	.0	2.7	9.9	3.5	1.9	18.0
TOTAL	2481	126.7	7989.8	20734.6	8504.3	4471.4	41826.8	.1	3.2	8.4	3.4	1.8	16.9

2000 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CRIF	102	6.1	322.0	775.0	474.2	3.4	1580.6	.1	3.2	7.6	4.6	.0	15.5
ICG	43	1.6	131.0	549.7	136.9	48.7	867.9	.0	3.0	12.8	3.2	1.1	20.2
MKT	84	5.2	256.4	838.8	378.9	106.4	1585.6	.1	3.1	10.0	4.5	1.3	18.9
MP	32	.6	100.7	336.3	81.1	69.9	588.5	.0	3.1	10.5	2.5	2.2	18.4
NW	81	2.2	252.1	867.2	296.8	147.2	1565.4	.0	3.1	10.7	3.7	1.8	19.3
SLSF	639	24.5	1917.9	5217.2	2363.2	1468.3	10991.1	.0	3.0	8.2	3.7	2.3	17.2
SSW	214	23.9	701.7	1547.8	779.4	475.0	3527.7	.1	3.3	7.2	3.6	2.2	16.5
TRRA	1286	62.6	4308.1	10602.6	3994.0	2152.7	21119.9	.0	3.4	8.2	3.1	1.7	16.4
TOTAL	2481	126.7	7989.8	20734.6	8504.3	4471.4	41826.8	.1	3.2	8.4	3.4	1.8	16.9

2000 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-L02	102	0.	382.5	910.4	304.4	192.2	1789.4	0.	3.8	8.9	3.0	1.9	17.5
4E04	37	0.	128.3	492.7	126.1	76.7	823.8	0.	3.5	13.3	3.4	2.1	22.3
4G04	112	0.	408.8	566.3	389.5	252.9	1617.5	0.	3.7	5.1	3.5	2.3	14.4
4Q04	80	0.	218.7	544.7	333.6	76.9	1173.9	0.	2.7	6.8	4.2	1.0	14.7
4R04	56	0.	148.4	365.1	207.1	109.7	830.3	0.	2.7	6.5	3.7	2.0	14.8
4R06	16	0.	36.0	178.9	35.7	25.1	275.7	0.	2.3	11.2	2.2	1.6	17.2
7M10	46	0.	154.9	576.0	170.6	59.1	960.6	0.	3.4	12.5	3.7	1.3	20.9
AC72	79	0.	204.1	557.4	175.2	194.0	1130.7	0.	2.6	7.1	2.2	2.5	14.3
BM01	54	0.	81.9	945.1	173.8	165.3	1366.1	0.	1.5	17.5	3.2	3.1	25.3
BM07	65	2.2	256.8	851.5	276.2	182.0	1560.6	.0	4.0	13.1	4.2	2.8	24.1
CM03	105	0.	245.0	780.1	314.6	258.6	1598.4	0.	2.3	7.4	3.0	2.5	15.2
CM05	63	0.	185.9	124.1	268.9	38.7	617.6	0.	3.0	2.0	4.3	.6	9.8
CM19	9	.3	23.9	77.3	28.2	16.4	146.0	.0	2.7	8.6	3.1	1.8	16.2
DM03	31	0.	70.8	300.6	108.1	41.4	520.9	0.	2.3	9.7	3.5	1.3	16.8
EF04	126	0.	522.1	1709.6	365.3	201.9	2798.8	0.	4.1	13.6	2.9	1.6	22.2
FM11	27	5.9	72.9	373.1	117.5	26.1	595.4	.2	2.7	13.8	4.4	1.0	22.1
GM01	78	16.9	210.6	1499.7	228.7	150.3	2106.1	.2	2.7	19.2	2.9	1.9	27.0
GM03	96	8.0	384.0	399.4	289.1	156.8	1237.4	.1	4.0	4.2	3.0	1.6	12.9
GM05	75	0.	277.5	769.1	257.3	159.1	1463.1	0.	3.7	10.3	3.4	2.1	19.5
GM07	85	0.	307.4	608.7	307.2	159.6	1382.9	0.	3.6	7.2	3.6	1.9	16.3
GM09	118	23.6	454.3	724.2	506.1	291.6	1999.7	.2	3.9	6.1	4.3	2.5	16.9
GM11	49	9.8	150.3	473.3	189.0	116.5	938.9	.2	3.1	9.7	3.9	2.4	19.2
HM06	22	1.8	52.4	299.0	78.0	24.3	455.5	.1	2.4	13.6	3.5	1.1	20.7
L102	160	0.	458.1	811.4	558.1	252.6	2080.2	0.	2.9	5.1	3.5	1.6	13.0
LG92	108	0.	253.8	660.3	353.5	237.7	1505.3	0.	2.4	6.1	3.3	2.2	13.9
LM04	143	0.	562.9	1060.1	593.1	92.1	2308.2	0.	3.9	7.4	4.1	.6	16.1
LR02	29	8.7	78.3	562.8	91.1	39.8	780.8	.3	2.7	19.4	3.1	1.4	26.9
LR04	162	43.2	644.7	904.2	512.1	208.8	2313.0	.3	4.0	5.6	3.2	1.3	14.3
TM37	6	0.	13.3	85.6	26.8	7.6	133.3	0.	2.2	14.3	4.5	1.3	22.2
VM04	98	0.	328.3	529.1	344.3	170.5	1372.1	0.	3.4	5.4	3.5	1.7	14.0
VM10	99	0.	326.7	895.8	325.7	129.2	1677.4	0.	3.3	9.0	3.3	1.3	16.9
WM03	63	6.3	177.5	510.9	207.2	121.8	1023.6	.1	2.8	8.1	3.3	1.9	16.2
WM05	46	0.	87.4	196.9	152.1	146.0	582.4	0.	1.9	4.3	3.3	3.2	12.7
XM01	36	0.	81.6	391.3	90.1	90.6	653.6	0.	2.3	10.9	2.5	2.5	18.2
TOTAL	2481	126.7	7989.8	20734.6	8504.3	4471.4	41826.8	.1	3.2	8.4	3.4	1.8	16.9

2000 Two-Yard Directional Madison Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2618	78	1.1	279.7	1075.3	303.6	202.8	1862.5	.0	3.6	13.8	3.9	2.6	23.9
2622	44	0.	94.9	68.8	103.4	148.1	415.2	0.	2.2	1.6	2.4	3.4	9.4
2624	49	1.8	115.5	796.1	172.3	131.5	1217.2	.0	2.4	16.2	3.5	2.7	24.8
2626	50	3.0	135.2	621.8	144.2	127.5	1031.8	.1	2.7	12.4	2.9	2.6	20.6
2628	80	.1	245.6	126.9	344.3	40.0	756.8	.0	3.1	1.6	4.3	.5	9.5
2630	29	0.	73.8	459.2	71.5	73.5	678.1	0.	2.5	15.8	2.5	2.5	23.4
2632	46	.7	103.4	318.5	135.6	184.8	742.9	.0	2.2	6.9	2.9	4.0	16.1
2636	56	.2	178.9	427.9	221.1	46.7	874.8	.0	3.2	7.6	3.9	.8	15.6
2672	21	2.2	74.0	110.5	53.2	72.8	312.8	.1	3.5	5.3	2.5	3.5	14.9
2674	88	8.8	274.0	242.4	379.8	146.7	1051.7	.1	3.1	2.8	4.3	1.7	12.0
2676	98	6.7	343.0	969.8	434.1	294.0	2047.6	.1	3.5	9.9	4.4	3.0	20.9
C-92	102	6.1	322.0	775.0	474.2	3.4	1580.6	.1	3.2	7.6	4.6	.0	15.5
K-02	84	5.2	256.4	838.8	378.9	106.4	1585.6	.1	3.1	10.0	4.5	1.3	18.9
M202	50	1.9	182.8	392.6	137.5	105.8	820.6	.0	3.7	7.9	2.8	2.1	16.4
M206	60	0.	187.9	162.9	266.0	139.0	755.8	0.	3.1	2.7	4.4	2.3	12.6
M703	20	2.0	73.1	116.7	48.0	34.3	274.1	.1	3.7	5.8	2.4	1.7	13.7
MB04	93	4.8	341.7	569.4	296.5	296.1	1508.4	.1	3.7	6.1	3.2	3.2	16.2
MB14	88	4.1	298.3	1386.0	308.9	79.2	2076.5	.0	3.4	15.8	3.5	.9	23.6
MC02	54	1.4	190.1	506.0	168.3	41.4	907.2	.0	3.5	9.4	3.1	.8	16.8
MC06	25	0.	64.6	77.5	45.0	54.6	241.7	0.	2.6	3.1	1.8	2.2	9.7
MC08	39	0.	100.8	295.1	83.8	111.8	591.5	0.	2.6	7.6	2.2	2.9	15.2
MC10	37	1.3	142.5	111.5	74.0	74.6	403.9	.0	3.9	3.0	2.0	2.0	10.9
MC12	27	0.	109.5	263.0	70.7	0.	443.1	0.	4.1	9.7	2.6	0.	16.4
MC14	33	0.	77.3	304.9	71.5	92.4	546.2	0.	2.3	9.2	2.2	2.8	16.6
MD02	32	.6	100.7	336.3	81.1	69.9	588.5	.0	3.1	10.5	2.5	2.2	18.4
MD04	33	0.	124.0	120.3	74.3	65.5	384.0	0.	3.8	3.6	2.3	2.0	11.6
MF02	15	4.0	60.0	127.3	32.5	60.5	284.3	.3	4.0	8.5	2.2	4.0	19.0
MF04	22	0.	43.6	120.6	59.8	52.4	276.5	0.	2.0	5.5	2.7	2.4	12.6
MG02	43	.4	99.3	55.5	128.8	73.8	357.8	.0	2.3	1.3	3.0	1.7	8.3
MG04	30	3.4	78.3	315.4	112.0	19.5	528.5	.1	2.6	10.5	3.7	.7	17.6
MG06	43	7.2	143.4	761.6	140.5	75.3	1127.9	.2	3.3	17.7	3.3	1.8	26.2
MG08	14	1.2	48.2	108.8	26.1	23.6	207.9	.1	3.4	7.8	1.9	1.7	14.8
MH01	96	.5	323.9	806.5	377.2	92.8	1600.9	.0	3.4	8.4	3.9	1.0	16.7

2000 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
MH03	30	2.5	120.0	54.0	67.0	70.5	314.0	.1	4.0	1.8	2.2	2.4	10.5
MH05	90	3.4	306.8	576.8	345.4	132.0	1364.4	.0	3.4	6.4	3.8	1.5	15.2
MH07	93	8.3	368.9	182.2	386.1	38.8	984.3	.1	4.0	2.0	4.2	.4	10.6
MH09	31	6.7	83.7	666.5	76.0	10.3	843.2	.2	2.7	21.5	2.5	.3	27.2
MM02	16	0.	36.0	178.9	35.7	25.1	275.7	0.	2.3	11.2	2.2	1.6	17.2
MT29	36	8.6	139.3	464.8	83.4	5.4	701.5	.2	3.9	12.9	2.3	.2	19.5
MV10	43	1.1	107.3	450.5	134.0	105.3	798.3	.0	2.5	10.5	3.1	2.5	18.6
MW02	23	0.	97.4	386.4	54.1	39.5	577.3	0.	4.2	16.8	2.4	1.7	25.1
MW04	53	0.	161.7	120.9	165.3	121.0	568.9	0.	3.1	2.3	3.1	2.3	10.7
MW06	39	0.	165.1	911.3	106.0	82.5	1264.9	0.	4.2	23.4	2.7	2.1	32.4
MX08	10	0.	33.0	8.7	19.7	29.7	91.0	0.	3.3	.9	2.0	3.0	9.1
VA03	43	1.6	131.0	549.7	136.9	48.7	867.9	.0	3.0	12.8	3.2	1.1	20.2
VX02	66	1.5	207.8	396.9	207.9	126.5	940.5	.0	3.1	6.0	3.2	1.9	14.3
VX14	71	12.7	212.6	925.4	233.7	295.8	1680.1	.2	3.0	13.0	3.3	4.2	23.7
VX92	77	9.8	281.4	225.6	337.7	52.6	907.1	.1	3.7	2.9	4.4	.7	11.8
WL03	81	2.2	252.1	867.2	296.8	147.2	1565.4	.0	3.1	10.7	3.7	1.8	19.3
TOTAL	2481	126.7	7989.8	20734.6	8504.3	4471.4	41826.8	.1	3.2	8.4	3.4	1.8	16.9

2000 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	145	6.2	518.4	1441.4	490.2	342.9	2799.0	.0	3.6	9.9	3.4	2.4	19.3
CAVE	188	2.7	575.3	1295.1	442.7	374.8	2690.5	.0	3.1	6.9	2.4	2.0	14.3
GATE	130	12.2	369.1	1241.2	407.4	192.1	2222.0	.1	2.8	9.5	3.1	1.5	17.1
GCE	279	12.2	999.5	1565.5	1108.8	263.6	3949.5	.0	3.6	5.6	4.0	.9	14.2
GCW	61	9.2	203.7	720.5	143.0	80.8	1157.2	.2	3.3	11.8	2.3	1.3	19.0
IC	43	1.1	107.3	450.5	134.0	105.3	798.3	.0	2.5	10.5	3.1	2.5	18.6
ICCH	43	1.6	131.0	549.7	136.9	48.7	867.9	.0	3.0	12.8	3.2	1.1	20.2
ITC	20	2.0	73.1	116.7	48.0	34.3	274.1	.1	3.7	5.8	2.4	1.7	13.7
ITFR	16	0.	36.0	178.9	35.7	25.1	275.7	0.	2.3	11.2	2.2	1.6	17.2
KTDA	24	2.3	71.9	243.1	131.2	30.4	479.0	.1	3.0	10.1	5.5	1.3	20.0
KTHO	28	2.3	78.6	362.4	147.9	35.5	626.7	.1	2.8	12.9	5.3	1.3	22.4
KTKL	5	.4	20.0	11.5	23.3	6.3	61.5	.1	4.0	2.3	4.7	1.3	12.3
KTPK	27	.2	85.8	221.8	76.5	34.2	418.5	.0	3.2	8.2	2.8	1.3	15.5
MPD	65	.6	224.6	456.7	155.3	135.3	972.5	.0	3.5	7.0	2.4	2.1	15.0
MPW	110	1.9	370.7	555.5	403.5	244.8	1576.4	.0	3.4	5.0	3.7	2.2	14.3
MRS	36	2.7	121.6	514.0	115.2	32.4	785.8	.1	3.4	14.3	3.2	.9	21.8
NWBE	31	1.5	104.1	364.9	129.7	56.3	656.5	.0	3.4	11.8	4.2	1.8	21.2
NWCH	53	0.	161.7	120.9	165.3	121.0	568.9	0.	3.1	2.3	3.1	2.3	10.7
NWDK	19	.1	58.7	217.4	79.5	34.5	390.2	.0	3.1	11.4	4.2	1.8	20.5
NWDT	12	0.	33.4	138.6	38.2	21.8	232.1	0.	2.8	11.6	3.2	1.8	19.3
NWSC	19	.6	55.8	146.3	49.4	34.5	286.6	.0	2.9	7.7	2.6	1.8	15.1
NWW	89	0.	371.9	1560.7	230.7	122.0	2285.3	0.	4.2	17.5	2.6	1.4	25.7
RI	102	6.1	322.0	775.0	474.2	3.4	1580.6	.1	3.2	7.6	4.6	.0	15.5
SFAV	26	0.	79.3	237.5	96.6	21.7	435.1	0.	3.1	9.1	3.7	.8	16.7
SFBL	33	2.5	85.5	331.1	93.0	84.2	596.3	.1	2.6	10.0	2.8	2.6	18.1
SFCU	29	0.	73.8	459.2	71.5	73.5	678.1	0.	2.5	15.8	2.5	2.5	23.4
SFLD	17	.5	49.6	290.7	51.3	43.4	435.5	.0	2.9	17.1	3.0	2.6	25.6
SFMS	344	16.7	1142.3	2414.3	1461.8	683.5	5718.5	.0	3.3	7.0	4.2	2.0	16.6
SFSP	95	2.5	218.9	1114.6	307.9	316.3	1960.1	.0	2.3	11.7	3.2	3.3	20.6
SFTU	95	2.4	268.5	369.8	281.1	245.9	1167.7	.0	2.8	3.9	3.0	2.6	12.3
SSW	224	23.9	734.7	1556.5	799.0	504.6	3618.7	.1	3.3	6.9	3.6	2.3	16.2
TOFC	36	8.6	139.3	464.8	83.4	5.4	701.5	.2	3.9	12.9	2.3	.2	19.5
WFE	37	4.0	103.6	247.9	92.3	112.9	560.7	.1	2.8	6.7	2.5	3.1	15.2
TOTAL	2481	126.7	7989.8	20734.6	8504.3	4471.4	41826.8	.1	3.2	8.4	3.4	1.8	16.9

2000 Two-Yard Directional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Time of Day Interval	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	267	0.	580.7	2385.5	842.0	661.6	4469.7	0.	2.2	8.9	3.2	2.5	16.7
INT-2	495	16.9	1491.6	3970.0	1654.0	931.0	8063.6	.0	3.0	8.0	3.3	1.9	16.3
INT-3	578	8.0	2141.0	4924.8	1993.6	761.2	9828.6	.0	3.7	8.5	3.4	1.3	17.0
INT-4	283	43.2	1077.1	2249.4	940.0	427.0	4736.6	.2	3.8	7.9	3.3	1.5	16.7
INT-5	574	40.8	1952.6	4582.9	2162.8	1105.7	9844.7	.1	3.4	8.0	3.8	1.9	17.2
INT-6	284	17.8	746.8	2622.1	911.9	585.0	4883.5	.1	2.6	9.2	3.2	2.1	17.2
TOTAL	2481	126.7	7989.8	20734.6	8504.3	4471.4	41826.8	.1	3.2	8.4	3.4	1.8	16.9

B.15 Detention Time for 1985 Three-Yard Directional/Bidirectional Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classification

Time of Day Interval

1985 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	258	0.	827.0	3824.5	853.8	287.0	5672.2	0.	3.2	14.8	3.3	1.1	22.0
CR	12	0.	53.6	98.1	32.5	8.5	192.7	0.	4.5	8.2	2.7	.7	16.1
NW	46	0.	187.8	774.1	111.0	71.3	1144.2	0.	4.1	16.8	2.4	1.5	24.9
NWYD	181	0.	514.2	1963.6	584.7	198.3	3260.8	0.	2.8	10.8	3.2	1.1	18.0
TRRA	336	5.7	1586.1	2340.5	1016.1	321.2	5269.6	.0	4.7	7.0	3.0	1.0	15.7
TOTAL	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7

1985 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
TRRA	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7
TOTAL	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7

1985 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
4R06	12	0.	53.6	98.1	32.5	8.5	192.7	0.	4.5	8.2	2.7	.7	16.1
BM03	63	0.	548.1	424.9	188.4	86.8	1248.1	0.	8.7	6.7	3.0	1.4	19.8
BM05	31	5.7	102.8	125.2	100.7	26.7	361.1	.2	3.3	4.0	3.2	.9	11.6
FM02	4	0.	15.5	49.8	7.6	7.4	80.3	0.	3.9	12.4	1.9	1.9	20.1
FM08	17	0.	19.0	196.4	57.7	17.9	290.8	0.	1.1	11.6	3.4	1.1	17.1
GM01	14	0.	72.3	127.5	38.2	15.8	253.9	0.	5.2	9.1	2.7	1.1	18.1
GM03	66	0.	257.4	1584.0	224.5	97.4	2163.3	0.	3.9	24.0	3.4	1.5	32.8
GM05	74	0.	130.7	1648.7	197.6	130.3	1987.3	0.	1.8	22.3	2.7	1.8	26.9
GM07	104	0.	366.5	464.2	393.5	43.5	1267.7	0.	3.5	4.5	3.8	.4	12.2
HM06	14	0.	38.5	150.5	28.6	28.6	246.2	0.	2.8	10.8	2.0	2.0	17.6
IM08	18	0.	20.4	151.7	46.8	8.6	227.4	0.	1.1	8.4	2.6	.5	12.6
IM10	17	0.	58.9	177.5	49.8	14.6	300.8	0.	3.5	10.4	2.9	.9	17.7
IM12	19	0.	30.1	126.0	56.2	17.3	229.6	0.	1.6	6.6	3.0	.9	12.1
IM14	16	0.	144.0	222.2	48.1	8.7	422.9	0.	9.0	13.9	3.0	.5	26.4
IM16	10	0.	90.5	26.2	29.3	9.3	155.3	0.	9.1	2.6	2.9	.9	15.5
IM18	12	0.	49.2	135.1	44.7	9.2	238.2	0.	4.1	11.3	3.7	.8	19.8
IM20	19	0.	89.3	63.3	49.2	25.9	227.7	0.	4.7	3.3	2.6	1.4	12.0
NM03	84	0.	302.4	882.8	208.2	133.6	1527.0	0.	3.6	10.5	2.5	1.6	18.2
NM05	97	0.	211.8	1080.8	376.6	64.7	1733.8	0.	2.2	11.1	3.9	.7	17.9
VM03	79	0.	312.1	348.3	263.2	57.9	981.5	0.	4.0	4.4	3.3	.7	12.4
WM02	46	0.	187.8	774.1	111.0	71.3	1144.2	0.	4.1	16.8	2.4	1.5	24.9
XM03	17	0.	67.7	143.6	46.0	2.5	259.8	0.	4.0	8.4	2.7	.1	15.3
TOTAL	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7

1985 Three-Yard Directional/Bidirectional Madison Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
M501	28	0.	109.8	300.0	103.6	4.7	518.0	0.	3.9	10.7	3.7	.2	18.5
MB02	49	0.	103.5	865.5	125.5	120.9	1215.4	0.	2.1	17.7	2.6	2.5	24.8
MD04	20	0.	83.7	106.7	39.0	41.0	270.3	0.	4.2	5.3	2.0	2.1	13.5
MC01	69	0.	283.0	311.7	248.9	0.	843.7	0.	4.1	4.5	3.6	0.	12.2
MC03	97	0.	229.6	1162.8	421.3	21.0	1834.7	0.	2.4	12.0	4.3	.2	18.9
MC05	77	0.	278.8	1610.1	276.4	112.9	2278.2	0.	3.6	20.9	3.6	1.5	29.6
MC07	62	0.	222.1	61.7	238.3	0.	522.1	0.	3.6	1.0	3.8	0.	8.4
MF04	9	0.	28.0	251.5	13.4	23.6	244.4	0.	3.1	27.9	1.5	2.6	27.2
MF06	5	0.	18.2	35.8	15.8	1.8	71.5	0.	3.6	7.2	3.2	.4	14.3
MG02	22	0.	66.3	191.3	42.2	46.2	345.9	0.	3.0	8.7	1.9	2.1	15.7
MG04	24	.2	115.8	213.5	48.8	38.8	417.1	.0	4.8	8.9	2.0	1.6	17.4
MH01	19	0.	55.7	108.4	51.3	20.6	236.0	0.	2.9	5.7	2.7	1.1	12.4
MH03	26	0.	93.6	84.1	50.3	53.7	281.7	0.	3.6	3.2	1.9	2.1	10.8
MH05	48	0.	172.1	928.2	117.3	72.0	1289.6	0.	3.6	19.3	2.4	1.5	26.9
MH07	40	0.	115.3	121.7	107.0	85.3	429.4	0.	2.9	3.0	2.7	2.1	10.7
MI07	17	.4	74.1	295.0	30.6	12.5	412.5	.0	4.4	17.4	1.8	.7	24.3
MI09	21	0.	76.6	395.8	64.8	0.	537.1	0.	3.6	18.8	3.1	0.	25.6
MI11	16	0.	50.4	263.4	46.1	17.9	377.8	0.	3.1	16.5	2.9	1.1	23.6
MI13	13	.4	55.2	105.2	36.6	15.4	212.8	.0	4.2	9.1	2.8	1.2	16.4
MI15	11	.4	48.7	238.5	30.1	13.2	282.8	.0	4.4	21.7	2.7	1.2	25.7
MI17	10	0.	52.5	136.5	21.7	5.0	215.6	0.	5.2	13.7	2.2	.5	21.6
MI19	20	0.	102.1	275.4	41.7	3.0	422.1	0.	5.1	13.8	2.1	.2	21.1
MN02	54	0.	438.9	61.6	167.6	93.6	761.7	0.	8.1	1.1	3.1	1.7	14.1
MN04	60	4.4	234.0	549.9	232.4	47.0	1067.7	.1	3.9	9.2	3.9	.8	17.8
MV10	16	0.	60.9	326.7	27.7	36.3	451.6	0.	3.8	20.4	1.7	2.3	28.2
TOTAL	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7

1985 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	69	0.	187.2	972.2	164.5	161.9	1485.8	0.	2.7	14.1	2.4	2.3	21.5
BRE	16	0.	50.4	263.4	46.1	17.9	377.8	0.	3.1	16.5	2.9	1.1	23.6
CAVE	283	0.	915.8	2908.1	1128.9	134.0	5086.7	0.	3.2	10.3	4.0	.5	18.0
CNW	28	0.	109.8	300.0	103.6	4.7	518.0	0.	3.9	10.7	3.7	.2	18.5
GATE	46	.2	182.1	404.8	91.0	85.0	763.0	.0	4.0	8.8	2.0	1.8	16.6
GCE	85	0.	264.6	314.2	208.6	159.7	947.0	0.	3.1	3.7	2.5	1.9	11.1
GCW	48	0.	172.1	928.2	117.3	72.0	1289.6	0.	3.6	19.3	2.4	1.5	26.9
IC	16	0.	60.9	326.7	27.7	36.3	451.6	0.	3.8	20.4	1.7	2.3	28.2
LBLT	10	0.	52.5	136.5	21.7	5.0	215.6	0.	5.2	13.7	2.2	.5	21.6
NBLT	13	.4	55.2	105.2	36.6	15.4	212.8	.0	4.2	8.1	2.8	1.2	16.4
NWE	22	0.	97.7	238.1	56.1	0.	391.9	0.	4.4	10.8	2.6	0.	17.8
NWYD	114	4.4	672.9	611.5	400.0	140.6	1829.4	.0	5.9	5.4	3.5	1.2	16.0
PILS	20	0.	102.1	275.4	41.7	3.0	422.1	0.	5.1	13.8	2.1	.2	21.1
SBLT	21	0.	76.6	395.8	64.8	0.	537.1	0.	3.6	18.8	3.1	0.	25.6
TYLR	17	.4	74.1	295.0	30.6	12.5	412.5	.0	4.4	17.4	1.8	.7	24.3
UNON	11	.4	48.7	238.5	30.1	13.2	282.8	.0	4.4	21.7	2.7	1.2	25.7
WFE	14	0.	46.2	287.3	29.1	25.3	315.8	0.	3.3	20.5	2.1	1.8	22.6
TOTAL	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7

1985 Three-Yard Directional/Bidirectional Madison Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	73	0.	638.6	451.0	217.7	96.1	1403.4	0.	8.7	6.2	3.0	1.3	19.2
INT-2	45	0.	210.8	325.9	132.1	50.9	719.7	0.	4.7	7.2	2.9	1.1	16.0
INT-3	150	0.	559.8	2466.8	432.7	231.0	3690.3	0.	3.7	16.4	2.9	1.5	24.6
INT-4	310	0.	788.4	3522.9	1064.3	261.6	5517.1	0.	2.5	11.4	3.4	.8	17.8
INT-5	189	5.7	739.6	1539.0	561.1	174.2	3019.6	.0	3.9	8.1	3.0	.9	16.0
INT-6	66	0.	231.6	695.0	190.5	72.4	1189.4	0.	3.5	10.5	2.9	1.1	18.0
TOTAL	833	5.7	3168.7	9000.7	2598.2	886.2	15539.5	.0	3.8	10.8	3.1	1.1	18.7

B.16 Detention Time for 2000 Three-Yard Directional/Bidirectional Madison Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classifications

Time of Day Interval

2000 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	285	65.0	688.9	3087.5	1024.5	322.4	5188.2	.2	2.4	10.8	3.6	1.1	18.2
CR	16	2.1	77.1	133.6	45.9	23.9	282.6	.1	4.8	8.3	2.9	1.5	17.7
ICG	79	0.	282.6	511.2	325.9	48.4	1168.0	0.	3.6	6.5	4.1	.6	14.8
NW	75	0.	335.0	1374.6	236.1	163.6	2109.3	0.	4.5	18.3	3.1	2.2	28.1
NWYD	184	0.	540.8	692.8	617.5	208.6	2059.6	0.	2.9	3.8	3.4	1.1	11.2
TRRA	372	10.4	1429.7	3629.1	1145.0	610.8	6825.0	.0	3.8	9.8	3.1	1.6	18.3
TOTAL	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4

2000 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
TRRA	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4
TOTAL	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4

2000 Three-Yard Directional/Bidirectional Madison Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
4R06	16	2.1	77.1	133.6	45.9	23.9	282.6	.1	4.8	8.3	2.9	1.5	17.7
AC72	79	0.	282.6	511.2	325.9	48.4	1168.0	0.	3.6	6.5	4.1	.6	14.8
BM03	72	0.	374.4	510.9	213.9	133.3	1232.5	0.	5.2	7.1	3.0	1.9	17.1
BM05	48	10.4	171.2	1049.7	139.9	69.2	1440.4	.2	3.6	21.9	2.9	1.4	30.0
FM02	7	0.	30.7	105.9	19.5	24.6	180.7	0.	4.4	15.1	2.8	3.5	25.8
FM08	20	0.	80.0	190.4	73.3	23.2	366.8	0.	4.0	9.5	3.7	1.2	18.3
GM01	67	0.	128.4	692.8	247.9	14.2	1083.3	0.	1.9	10.3	3.7	.2	16.2
GM03	83	65.0	190.8	1193.9	296.6	71.3	1817.7	.8	2.3	14.4	3.6	.9	21.9
GM05	96	0.	293.0	947.4	337.8	181.1	1759.4	0.	3.1	9.9	3.5	1.9	18.3
GM07	39	0.	76.7	253.3	142.2	55.7	527.8	0.	2.0	6.5	3.6	1.4	13.5
HM06	22	0.	63.1	201.8	58.5	71.5	394.9	0.	2.9	9.2	2.7	3.2	17.9
IM08	17	0.	50.2	197.5	43.1	30.3	321.1	0.	3.0	11.6	2.5	1.8	18.9
IM10	17	0.	64.0	165.1	44.7	26.9	300.7	0.	3.8	9.7	2.6	1.6	17.7
IM12	19	0.	30.1	118.8	54.6	27.3	230.8	0.	1.6	6.3	2.9	1.4	12.1
IM14	16	0.	88.0	230.0	51.3	30.6	399.8	0.	5.5	14.4	3.2	1.9	25.0
IM16	12	0.	69.8	88.5	33.5	23.6	215.3	0.	5.8	7.4	2.8	2.0	17.9
IM18	15	0.	16.3	53.5	55.1	23.6	148.3	0.	1.1	3.6	3.7	1.6	9.9
IM20	25	0.	40.8	100.2	83.8	52.3	277.2	0.	1.6	4.0	3.4	2.1	11.1
NM03	86	0.	195.4	459.6	240.6	79.7	975.3	0.	2.3	5.3	2.8	.9	11.3
NM05	98	0.	345.3	233.2	376.9	128.9	1084.3	0.	3.5	2.4	3.8	1.3	11.1
VM03	55	0.	259.4	350.5	190.2	63.6	863.7	0.	4.7	6.4	3.5	1.2	15.7
WM02	75	0.	335.0	1374.6	236.1	163.6	2109.3	0.	4.5	18.3	3.1	2.2	28.1
XM03	27	0.	91.8	266.5	83.7	11.0	452.9	0.	3.4	9.9	3.1	.4	16.8
TOTAL	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4

2000 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
MS01	28	0.	82.1	242.3	56.0	56.0	436.3	0.	2.9	8.7	2.0	2.0	15.6
MB02	50	6.3	150.5	686.7	129.0	155.0	1127.5	.1	3.0	13.7	2.6	3.1	22.5
MB04	64	0.	217.5	416.1	222.8	132.3	988.6	0.	3.4	6.5	3.5	2.1	15.4
MC01	82	10.2	315.3	423.4	287.5	166.7	1203.1	.1	3.8	5.2	3.5	2.0	14.7
MC03	77	8.8	273.5	499.4	323.2	0.	1104.8	.1	3.6	6.5	4.2	0.	14.3
MC05	63	6.3	141.8	271.5	213.0	12.6	645.1	.1	2.3	4.3	3.4	.2	10.2
MC07	75	11.0	214.9	133.1	310.3	110.0	779.3	.1	2.9	1.8	4.1	1.5	10.4
MF04	14	.4	54.8	259.8	22.6	34.3	371.9	.0	3.9	18.6	1.6	2.5	26.6
MF06	5	0.	17.5	20.9	7.7	9.8	55.9	0.	3.5	4.2	1.5	2.0	11.2
MG02	34	0.	107.5	184.0	91.5	95.8	478.8	0.	3.2	5.4	2.7	2.8	14.1
MG04	52	3.7	187.0	951.8	172.6	62.4	1377.5	.1	3.6	18.3	3.3	1.2	26.5
MH01	36	0.	84.3	417.9	141.9	0.	644.1	0.	2.3	11.6	3.9	0.	17.9
MH03	38	0.	81.0	183.5	92.6	54.5	411.7	0.	2.1	4.8	2.4	1.4	10.8
MH05	63	23.8	181.1	749.6	247.7	0.	1202.2	.4	2.9	11.9	3.9	0.	19.1
MH07	39	0.	99.9	93.8	182.8	0.	376.4	0.	2.6	2.4	4.7	0.	9.7
MI07	18	.4	69.4	223.3	48.9	9.0	351.0	.0	3.9	12.4	2.7	.5	19.5
MI09	21	0.	73.4	275.4	44.1	11.2	404.2	0.	3.5	13.1	2.1	.5	19.2
MI11	21	.5	88.1	298.2	60.9	22.8	470.5	.0	4.2	14.2	2.9	1.1	22.4
MI13	16	.4	47.7	161.0	43.2	17.6	269.9	.0	3.0	10.1	2.7	1.1	16.9
MI15	11	.4	37.3	153.1	31.7	12.3	234.8	.0	3.4	13.9	2.9	1.1	21.3
MI17	15	0.	56.2	232.2	48.3	11.8	348.4	0.	3.7	15.5	3.2	.8	23.2
MI19	25	0.	84.2	371.5	91.3	8.8	555.7	0.	3.4	14.9	3.7	.4	22.2
MN02	66	0.	287.1	252.9	207.0	143.0	890.0	0.	4.3	3.8	3.1	2.2	13.5
MN04	74	5.4	303.1	1519.3	274.1	128.3	2230.2	.1	4.1	20.5	3.7	1.7	30.1
MV10	24	0.	99.0	408.1	44.4	123.6	675.0	0.	4.1	17.0	1.9	5.2	28.1
TOTAL	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4

2000 Three-Yard Directional/Bidirectional Madison Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	114	6.3	368.0	1102.8	351.8	287.3	2116.1	.1	3.2	9.7	3.1	2.5	18.6
BRE	21	.5	88.1	298.2	60.9	22.8	470.5	.0	4.2	14.2	2.9	1.1	22.4
CAVE	274	36.2	853.9	1132.7	1072.6	242.6	3337.9	.1	3.1	4.1	3.9	.9	12.2
CNW	28	0.	82.1	242.3	56.0	56.0	436.3	0.	2.9	8.7	2.0	2.0	15.6
GATE	86	3.7	294.5	1135.8	264.1	158.2	1856.2	.0	3.4	13.2	3.1	1.8	21.6
GCE	113	0.	265.2	695.2	417.3	54.5	1432.2	0.	2.3	6.2	3.7	.5	12.7
GCW	63	23.8	181.1	749.6	247.7	0.	1202.2	.4	2.9	11.9	3.9	0.	19.1
IC	24	0.	99.0	408.1	44.4	123.6	675.0	0.	4.1	17.0	1.9	5.2	28.1
LBLT	15	0.	56.2	232.2	48.3	11.8	348.4	0.	3.7	15.5	3.2	.8	23.2
NBLT	16	.4	47.7	161.0	43.2	17.6	269.9	.0	3.0	10.1	2.7	1.1	16.9
NWE	23	0.	91.6	194.7	61.3	46.8	394.4	0.	4.0	8.5	2.7	2.0	17.1
NWYD	140	5.4	590.2	1772.3	481.0	271.3	3120.2	.0	4.2	12.7	3.4	1.9	22.3
PILS	25	0.	84.2	371.5	91.3	8.8	555.7	0.	3.4	14.9	3.7	.4	22.2
SBLT	21	0.	73.4	275.4	44.1	11.2	404.2	0.	3.5	13.1	2.1	.5	19.2
TYLR	18	.4	69.4	223.3	48.9	9.0	351.0	.0	3.9	12.4	2.7	.5	19.5
UNON	11	.4	37.3	153.1	31.7	12.3	234.8	.0	3.4	13.9	2.9	1.1	21.3
WFE	19	.4	72.3	280.7	30.3	44.1	427.8	.0	3.8	14.8	1.6	2.3	22.5
TOTAL	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4

2000 Three-Yard Directional/Bidirectional Madison Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	84	0.	444.2	599.4	247.4	156.9	1447.8	0.	5.3	7.1	2.9	1.9	17.2
INT-2	107	0.	185.5	846.5	386.8	90.1	1508.8	0.	1.7	7.9	3.6	.8	14.1
INT-3	169	65.0	386.2	1653.5	537.2	151.1	2793.0	.4	2.3	9.8	3.2	.9	16.5
INT-4	267	0.	829.2	1796.5	944.6	422.9	3993.3	0.	3.1	6.7	3.5	1.6	15.0
INT-5	228	12.5	965.2	3280.7	715.3	355.7	5329.5	.1	4.2	14.4	3.1	1.6	23.4
INT-6	156	0.	543.7	1252.1	563.6	200.9	2560.3	0.	3.5	8.0	3.6	1.3	16.4
TOTAL	1011	77.5	3354.0	9428.7	3394.9	1377.6	17632.7	.1	3.3	9.3	3.4	1.4	17.4

B.17 Detention Time for 1985 Three-Yard Directional New Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classifications

Time of Day Interval

1985 Three-Yard Directional New Yard

Inbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	490	45.7	1918.7	4255.0	1633.8	842.6	8695.8	.1	3.9	8.7	3.3	1.7	17.7
BO	224	61.5	1080.9	1755.6	774.5	303.4	3975.9	.3	4.8	7.8	3.5	1.4	17.7
CR	761	214.5	3380.0	7011.4	2469.8	1311.3	14387.0	.3	4.4	9.2	3.2	1.7	18.9
CRIP	64	48.0	237.9	411.2	220.6	73.1	990.8	.8	3.7	6.4	3.4	1.1	15.5
ICG	131	65.3	743.5	1166.2	450.4	202.9	2628.2	.5	5.7	8.9	3.4	1.5	20.1
LN	85	53.8	405.2	877.3	281.3	142.7	1760.3	.6	4.8	10.3	3.3	1.7	20.7
MP	173	49.7	851.6	2132.2	547.1	341.1	3921.8	.3	4.9	12.3	3.2	2.0	22.7
NW	134	0.	527.2	711.3	378.9	235.0	1852.5	0.	3.9	5.3	2.8	1.8	13.8
NWYD	28	0.	69.9	344.1	83.8	44.8	542.5	0.	2.5	12.3	3.0	1.6	19.4
TRRA	211	18.0	524.6	1994.9	630.0	326.8	3494.2	.1	2.5	9.5	3.0	1.5	16.6
TOTAL	2301	556.5	9739.4	20659.1	7470.2	3823.7	42248.9	.2	4.2	9.0	3.2	1.7	18.4

1985 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	45	2.1	271.6	542.9	96.4	124.7	1037.7	.0	6.0	12.1	2.1	2.8	23.1
CRIP	68	28.8	380.5	319.4	269.0	69.1	1066.9	.4	5.6	4.7	4.0	1.0	15.7
MKT	75	15.2	273.7	1090.2	288.4	170.0	1837.4	.2	3.6	14.5	3.8	2.3	24.5
MP	578	142.0	2449.0	5766.9	1940.0	1086.6	11384.4	.2	4.2	10.0	3.4	1.9	19.7
NW	42	9.7	165.4	292.8	136.2	84.0	688.1	.2	3.9	7.0	3.2	2.0	16.4
NWYD	851	280.5	3793.9	7568.9	2768.3	1294.0	15705.6	.3	4.5	8.9	3.3	1.5	18.5
SLSF	477	50.7	1580.3	4139.5	1418.3	738.0	7926.7	.1	3.3	8.7	3.0	1.5	16.6
SSW	165	27.7	824.9	938.5	553.6	257.3	2602.0	.2	5.0	5.7	3.4	1.6	15.8
TOTAL	2301	556.5	9739.4	20659.1	7470.2	3823.7	42248.9	.2	4.2	9.0	3.2	1.7	18.4

1985 Three-Yard Directional New Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-C01	64	48.0	237.9	411.2	220.6	73.1	990.8	.8	3.7	6.4	3.4	1.1	15.5
-L02	59	0.	410.1	650.1	193.6	113.6	1367.3	0.	6.9	11.0	3.3	1.9	23.2
2N01	71	49.7	267.4	932.8	210.6	176.3	1636.8	.7	3.8	13.1	3.0	2.5	23.1
2N03	43	0.	174.2	549.3	143.0	51.3	917.7	0.	4.1	12.8	3.3	1.2	21.3
4E02	8	7.3	19.3	26.0	20.0	16.7	89.3	.9	2.4	3.3	2.5	2.1	11.2
4E04	35	8.2	145.3	382.6	116.8	43.5	696.3	.2	4.2	10.9	3.3	1.2	19.9
4G02	61	46.8	410.7	711.4	205.1	99.4	1473.4	.8	6.7	11.7	3.4	1.6	24.2
4G04	96	30.4	331.2	719.3	303.6	148.7	1533.2	.3	3.5	7.5	3.2	1.5	16.0
4Q04	85	15.6	585.1	627.8	334.2	94.5	1657.1	.2	6.9	7.4	3.9	1.1	19.5
4R04	54	16.2	122.4	371.5	181.7	116.9	808.6	.3	2.3	6.9	3.4	2.2	15.0
CN05	69	0.	157.6	357.2	156.4	147.4	818.6	0.	2.3	5.2	2.3	2.1	11.9
EF04	85	53.8	405.2	877.3	281.3	142.7	1760.3	.6	4.8	10.3	3.3	1.7	20.7
GN01	98	45.7	761.1	877.5	372.7	152.5	2209.5	.5	7.8	9.0	3.8	1.6	22.5
GN03	75	0.	402.5	726.6	239.1	122.7	1490.9	0.	5.4	9.7	3.2	1.6	19.9
GN05	46	0.	141.1	452.1	163.5	77.0	833.6	0.	3.1	9.8	3.6	1.7	18.1
GN07	84	0.	264.6	507.6	253.4	133.1	1158.7	0.	3.2	6.0	3.0	1.6	13.8
GN09	80	0.	165.3	668.4	241.4	159.9	1235.1	0.	2.1	8.4	3.0	2.0	15.4
GN11	49	0.	87.4	254.7	158.0	82.2	582.3	0.	1.8	5.2	3.2	1.7	11.9
GN13	58	0.	96.7	768.1	205.8	115.1	1185.7	0.	1.7	13.2	3.5	2.0	20.4
L102	136	0.	421.6	973.8	436.6	112.5	1944.5	0.	3.1	7.2	3.2	.8	14.3
LD02	142	0.	442.6	1654.8	501.6	261.1	2860.0	0.	3.1	11.7	3.5	1.8	20.1
LG92	81	0.	244.6	372.1	230.0	147.4	994.1	0.	3.0	4.6	2.8	1.8	12.3
LM04	135	144.0	864.0	1191.3	491.2	251.1	2941.5	1.1	6.4	8.8	3.6	1.9	21.8
LM08	50	7.5	67.5	223.1	141.3	108.7	548.0	.2	1.4	4.5	2.8	2.2	11.0
LR02	29	0.	117.0	289.4	88.3	49.2	544.0	0.	4.0	10.0	3.0	1.7	18.8
LR04	154	0.	934.3	1596.2	424.1	312.5	3267.0	0.	6.1	10.4	2.8	2.0	21.2
LW08	53	0.	282.7	339.2	148.9	87.6	858.4	0.	5.3	6.4	2.8	1.7	16.2
MN02	72	18.0	235.2	820.0	250.2	96.2	1419.7	.3	3.3	11.4	3.5	1.3	19.7
MN04	70	0.	131.8	817.6	223.4	83.2	1256.0	0.	1.9	11.7	3.2	1.2	17.9
FN19	21	0.	43.4	250.2	64.4	28.7	386.8	0.	2.1	11.9	3.1	1.4	18.4
VN01	64	59.7	457.6	694.0	222.1	89.1	1522.5	.9	7.2	10.8	3.5	1.4	23.8
VN03	67	5.6	285.9	472.2	228.3	113.8	1105.7	.1	4.3	7.0	3.4	1.7	16.5
XN03	7	0.	26.5	93.9	19.4	16.1	155.8	0.	3.8	13.4	2.8	2.3	22.3
TOTAL	2301	556.5	9739.4	20659.1	7470.2	3823.7	42248.9	.2	4.2	9.0	3.2	1.7	18.4

1985 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2618	60	9.3	210.9	690.4	183.3	35.0	1129.0	.2	3.5	11.5	3.1	.6	18.8
2620	18	0.	38.6	153.5	31.2	59.4	282.8	0.	2.1	8.5	1.7	3.3	15.7
2622	44	14.5	196.1	682.0	131.2	117.3	1141.2	.3	4.5	15.5	3.0	2.7	25.9
2624	70	13.2	241.3	650.1	221.2	79.3	1205.1	.2	3.4	9.3	3.2	1.1	17.2
2626	67	4.0	314.1	457.3	219.6	111.7	1106.7	.1	4.7	6.8	3.3	1.7	16.5
2628	45	.9	138.0	107.3	126.6	44.3	417.0	.0	3.1	2.4	2.8	1.0	9.3
2630	12	1.9	46.2	178.6	26.6	27.8	281.0	.2	3.8	14.9	2.2	2.3	23.4
2632	10	0.	41.3	185.6	18.2	20.7	265.7	0.	4.1	18.6	1.8	2.1	26.6
2636	18	0.	55.8	474.9	40.5	21.3	592.5	0.	3.1	26.4	2.3	1.2	32.9
2672	29	0.	64.7	36.8	59.5	57.0	218.0	0.	2.2	1.3	2.1	2.0	7.5
2674	26	0.	55.9	56.3	79.7	38.1	230.0	0.	2.1	2.2	3.1	1.5	8.8
2676	78	7.0	177.3	466.8	280.7	126.1	1057.9	.1	2.3	6.0	3.6	1.6	13.6
C-92	68	28.8	380.5	319.4	269.0	69.1	1066.9	.4	5.6	4.7	4.0	1.0	15.7
DX04	84	27.4	505.3	338.1	312.0	156.8	1339.6	.3	6.0	4.0	3.7	1.9	15.9
DX06	61	15.7	266.5	552.4	235.5	71.2	1141.3	.3	4.4	9.1	3.9	1.2	18.7
DX10	59	1.5	294.1	599.3	190.8	104.2	1189.9	.0	5.0	10.2	3.2	1.8	20.2
DX16	44	9.5	179.4	711.1	115.9	99.7	1115.7	.2	4.1	16.2	2.6	2.3	25.4
DX18	86	22.1	266.6	1530.8	255.9	131.9	2207.3	.3	3.1	17.8	3.0	1.5	25.7
DX20	70	11.6	266.5	685.5	348.2	2.3	1314.1	.2	3.8	9.8	5.0	.0	18.8
DX72	15	8.7	60.9	288.3	42.3	46.0	446.2	.6	4.1	19.2	2.8	3.1	29.7
DX74	44	4.7	141.7	186.1	109.5	157.7	599.7	.1	3.2	4.2	2.5	3.6	13.6
DX76	47	19.7	156.4	205.3	132.7	173.9	688.0	.4	3.3	4.4	2.8	3.7	14.6
DX98	68	21.0	311.6	670.2	197.2	142.8	1342.8	.3	4.6	9.9	2.9	2.1	19.7
K-02	75	15.2	273.7	1090.2	288.4	170.0	1837.4	.2	3.6	14.5	3.8	2.3	24.5
N103	22	5.5	126.6	338.5	45.8	51.3	567.7	.3	5.8	15.4	2.1	2.3	25.8
N202	37	9.2	127.5	149.0	91.3	4.3	381.3	.2	3.4	4.0	2.5	.1	10.3
N204	48	11.2	234.0	782.5	128.8	159.2	1315.6	.2	4.9	16.3	2.7	3.3	27.4
NC02	24	3.6	32.4	28.0	61.6	58.4	184.0	.2	1.4	1.2	2.6	2.4	7.7
NC04	96	39.1	469.0	1034.1	288.3	184.8	2015.3	.4	4.9	10.8	3.0	1.9	21.0
NC06	21	0.	65.1	136.9	52.9	37.5	292.3	0.	3.1	6.5	2.5	1.8	13.9
NG01	53	.6	156.9	158.8	173.1	91.9	581.3	.0	3.0	3.0	3.3	1.7	11.0
NG03	38	3.5	142.8	364.0	102.0	51.9	664.1	.1	3.8	9.6	2.7	1.4	17.5
NG05	34	15.3	151.6	95.7	75.9	51.6	390.1	.4	4.5	2.8	2.2	1.5	11.5
NG07	60	33.4	265.8	367.9	227.8	56.0	950.8	.6	4.4	6.1	3.8	.9	15.8
NM03	96	73.0	528.7	643.7	413.2	198.4	1857.0	.8	5.5	6.7	4.3	2.1	19.3
NM05	77	10.5	354.8	796.8	332.2	9.0	1503.2	.1	4.6	10.3	4.3	.1	19.5
NF02	18	1.5	92.3	126.7	43.8	46.8	311.1	.1	5.1	7.0	2.4	2.6	17.3
NV02	36	10.9	118.0	193.0	90.0	75.0	486.9	.3	3.3	5.4	2.5	2.1	13.5

1985 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NW02	65	32.5	353.1	569.0	210.2	114.8	1279.6	.5	5.4	8.8	3.2	1.8	19.7
NW04	60	4.4	197.7	379.1	172.8	25.0	779.0	.1	3.3	6.3	2.9	.4	13.0
NX02	66	26.3	377.8	1405.4	258.8	78.1	2146.4	.4	5.7	21.3	3.9	1.2	32.5
RL01	45	2.1	271.6	542.9	96.4	124.7	1037.7	.0	6.0	12.1	2.1	2.8	23.1
VX02	38	.3	218.8	104.7	114.6	89.9	528.4	.0	5.8	2.8	3.0	2.4	13.9
VX14	57	2.3	164.1	642.4	164.8	135.9	1109.4	.0	2.9	11.3	2.9	2.4	19.5
VX92	70	25.1	442.1	191.4	274.2	31.5	964.2	.4	6.3	2.7	3.9	.5	13.8
WL03	42	9.7	165.4	292.8	136.2	84.0	688.1	.2	3.9	7.0	3.2	2.0	16.4
TOTAL	2301	556.5	9739.4	20659.1	7470.2	3823.7	42248.9	.2	4.2	9.0	3.2	1.7	18.4

1985 Three-Yard Directional New Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	29	2.7	151.1	419.9	98.1	3.4	675.1	.1	5.2	14.5	3.4	.1	23.3
CAVE	141	42.7	566.5	1198.9	402.7	280.7	2491.5	.3	4.0	8.5	2.9	2.0	17.7
CREA	45	2.1	271.6	542.9	96.4	124.7	1037.7	.0	6.0	12.1	2.1	2.8	23.1
GATE	185	52.8	717.0	986.4	578.8	251.4	2586.4	.3	3.9	5.3	3.1	1.4	14.0
IC	36	10.9	118.0	193.0	90.0	75.0	486.9	.3	3.3	5.4	2.5	2.1	13.5
ITC	22	5.5	126.6	338.5	45.8	51.3	567.7	.3	5.8	15.4	2.1	2.3	25.8
KTDA	20	4.0	85.4	349.9	91.7	45.3	576.2	.2	4.3	17.5	4.6	2.3	28.8
KTHO	18	1.8	52.9	257.6	77.4	40.8	430.4	.1	2.9	14.3	4.3	2.3	23.9
KTKL	17	0.	35.7	136.3	66.0	38.5	276.5	0.	2.1	8.0	3.9	2.3	16.3
KTPK	20	9.4	99.8	346.5	53.3	45.3	554.3	.5	5.0	17.3	2.7	2.3	27.7
MAD	144	80.8	732.5	1020.6	647.3	204.0	2685.1	.6	5.1	7.1	4.5	1.4	18.6
MPAR	7	3.8	41.8	58.2	27.3	.2	131.3	.5	6.0	8.3	3.9	.0	18.8
MPDA	51	4.2	181.4	470.3	281.1	1.7	938.7	.1	3.6	9.2	5.5	.0	18.4
MPDX	20	1.5	89.3	181.3	64.7	35.3	372.2	.1	4.5	9.1	3.2	1.8	18.6
MPFE	36	10.6	136.0	287.4	134.8	70.8	639.6	.3	3.8	8.0	3.7	2.0	17.8
MPFW	12	3.5	43.3	157.0	39.8	.4	244.1	.3	3.6	13.1	3.3	.0	20.3
MPHO	38	10.8	176.7	390.9	136.2	44.3	758.8	.3	4.6	10.3	3.6	1.2	20.0
MPLA	71	10.2	263.8	776.7	183.9	208.3	1442.8	.1	3.7	10.9	2.6	2.9	20.3
MPLR	137	45.2	651.6	1439.1	475.9	234.5	2846.3	.3	4.8	10.5	3.5	1.7	20.8
MPMP	10	7.1	43.6	187.4	28.2	30.7	297.0	.7	4.4	18.7	2.8	3.1	29.7
MPNO	115	40.7	468.0	875.5	329.9	316.7	2030.8	.4	4.1	7.6	2.9	2.8	17.7
MPPB	33	4.2	120.4	429.8	92.0	54.2	700.6	.1	3.6	13.0	2.8	1.6	21.2
MPSA	9	0.	28.5	95.4	20.3	20.4	164.6	0.	3.2	10.6	2.3	2.3	18.3
MPVA	39	0.	204.7	418.0	126.1	68.9	817.7	0.	5.2	10.7	3.2	1.8	21.0
MPW	85	20.4	361.5	931.4	220.1	163.5	1696.9	.2	4.3	11.0	2.6	1.9	20.0
MRS	18	1.5	92.3	126.7	43.8	46.8	311.1	.1	5.1	7.0	2.4	2.6	17.3
NWBE	20	3.7	71.1	105.4	71.7	40.0	291.9	.2	3.6	5.3	3.6	2.0	14.6
NWDK	11	5.9	66.6	127.6	35.8	22.0	257.9	.5	6.1	11.6	3.3	2.0	23.4
NWSC	11	0.	27.7	59.8	28.8	22.0	138.3	0.	2.5	5.4	2.6	2.0	12.6
NWW	125	37.0	550.7	948.1	383.0	139.8	2058.6	.3	4.4	7.6	3.1	1.1	16.5
RI	68	28.8	380.5	319.4	269.0	69.1	1066.9	.4	5.6	4.7	4.0	1.0	15.7
SFAV	18	0.	55.8	474.9	40.5	21.3	592.5	0.	3.1	26.4	2.3	1.2	32.9
SFBL	16	1.7	78.9	178.8	49.6	26.7	335.6	.1	4.9	11.2	3.1	1.7	21.0
SFCU	18	0.	38.6	153.5	31.2	59.4	282.8	0.	2.1	8.5	1.7	3.3	15.7
SFLD	10	0.	41.3	185.6	18.2	20.7	265.7	0.	4.1	18.6	1.8	2.1	26.6
SFMS	260	19.5	817.4	1599.2	840.3	328.5	3605.0	.1	3.1	6.2	3.2	1.3	13.9
SFO	12	1.9	46.2	178.6	26.6	27.8	281.0	.2	3.8	14.9	2.2	2.3	23.4
SFSP	70	13.2	241.3	650.1	221.2	79.3	1205.1	.2	3.4	9.3	3.2	1.1	17.2
SFTU	73	14.5	260.8	718.8	190.7	174.4	1359.1	.2	3.6	9.8	2.6	2.4	18.6
SSW	231	54.0	1202.7	2343.9	812.4	335.4	4748.4	.2	5.2	10.1	3.5	1.5	20.6
TOTAL	2301	556.5	9739.4	20659.1	7470.2	3823.7	42248.9	.2	4.2	9.0	3.2	1.7	18.4

1985 Three-Yard Directional New Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	269	0.	621.3	1801.6	767.7	460.2	3650.9	0.	2.3	6.7	2.9	1.7	13.6
INT-2	785	295.8	3090.2	7768.6	2607.2	1234.7	14996.5	.4	3.9	9.9	3.3	1.6	19.1
INT-3	505	205.3	3305.4	4412.4	1779.5	822.0	10524.7	.4	6.5	8.7	3.5	1.6	20.8
INT-4	272	18.0	1310.5	2868.4	837.8	485.6	5520.3	.1	4.8	10.5	3.1	1.8	20.3
INT-5	286	13.8	1056.7	2545.1	913.6	435.7	4964.9	.0	3.7	8.9	3.2	1.5	17.4
INT-6	184	23.7	355.2	1263.0	564.4	385.5	2591.7	.1	1.9	6.9	3.1	2.1	14.1
TOTAL	2301	556.5	9739.4	20659.1	7470.2	3823.7	42248.9	.2	4.2	9.0	3.2	1.7	18.4

B.18 Detention Time for 2000 Three-Yard Directional New Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classifications

Time of Day Interval

2000 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	539	65.3	2960.2	4615.4	1848.2	564.8	10053.9	.1	5.5	8.6	3.4	1.0	18.7
BO	254	50.8	953.1	2421.0	859.3	354.4	4638.6	.2	3.8	9.5	3.4	1.4	18.3
CR	1084	156.8	6020.2	7639.2	3515.1	1626.0	18957.3	.1	5.6	7.0	3.2	1.5	17.5
CRIP	149	111.8	1317.0	1592.3	437.0	271.7	3729.6	.8	8.8	10.7	2.9	1.8	25.0
ICG	142	54.8	971.8	1065.9	464.3	191.4	2748.1	.4	6.8	7.5	3.3	1.3	19.4
LN	137	89.0	472.7	1811.9	479.0	196.2	3048.8	.6	3.5	13.2	3.5	1.4	22.3
MP	220	28.4	941.9	2206.3	728.7	257.2	4162.5	.1	4.3	10.0	3.3	1.2	18.9
NW	329	0.	1764.6	3308.9	1095.5	466.7	6635.6	0.	5.4	10.1	3.3	1.4	20.2
NWYD	29	4.6	120.7	140.0	89.4	21.3	376.0	.2	4.2	4.8	3.1	.7	13.0
TRRA	312	26.4	853.6	2862.2	1019.6	403.5	5165.2	.1	2.7	9.2	3.3	1.3	16.6
TOTAL	3195	587.8	16375.6	27663.1	10536.0	4353.2	59515.6	.2	5.1	8.7	3.3	1.4	18.6

2000 Three-Yard Directional New Yard

Outbound Road	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
CR	45	.2	324.3	497.2	126.8	89.3	1037.7	.0	7.2	11.0	2.8	2.0	23.1
CRIF	97	19.3	511.4	1149.4	349.6	126.1	2155.8	.2	5.3	11.8	3.6	1.3	22.2
MKT	100	12.7	388.6	1232.3	403.4	13.3	2050.4	.1	3.9	12.3	4.0	.1	20.5
MP	890	171.8	5650.4	7558.9	3187.0	895.9	17464.0	.2	6.3	8.5	3.6	1.0	19.6
NW	64	13.8	364.5	850.0	214.4	105.6	1548.2	.2	5.7	13.3	3.4	1.7	24.2
NWYD	1090	260.2	5424.3	9991.8	3379.0	1902.1	20957.4	.2	5.0	9.2	3.1	1.7	19.2
SLSF	706	65.3	2557.8	5382.5	2177.4	987.2	11170.3	.1	3.6	7.6	3.1	1.4	15.8
SSW	203	44.4	1154.3	1001.1	698.5	233.7	3131.9	.2	5.7	4.9	3.4	1.2	15.4
TOTAL	3195	587.8	16375.6	27663.1	10536.0	4353.2	59515.6	.2	5.1	8.7	3.3	1.4	18.6

2000 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-C01	149	111.8	1317.0	1592.3	437.0	271.7	3729.6	.8	8.8	10.7	2.9	1.8	25.0
-L02	102	0.	464.1	1073.2	307.6	172.5	2017.5	0.	4.6	10.5	3.0	1.7	19.8
2N01	74	28.4	162.8	538.9	269.1	57.9	1057.1	.4	2.2	7.3	3.6	.8	14.3
2N03	44	0.	315.0	594.2	152.0	26.8	1088.0	0.	7.2	13.5	3.5	.6	24.7
4E02	12	8.6	38.4	15.2	40.2	31.6	134.0	.7	3.2	1.3	3.4	2.6	11.2
4E04	37	8.6	113.5	362.8	120.9	63.3	669.1	.2	3.1	9.8	3.3	1.7	18.1
4G02	66	29.7	246.4	681.0	226.5	79.2	1262.7	.5	3.7	10.3	3.4	1.2	19.1
4G04	109	0.	412.4	832.3	355.3	142.2	1742.2	0.	3.8	7.6	3.3	1.3	16.0
4Q04	96	33.6	388.8	1210.8	342.9	117.3	2093.4	.4	4.1	12.6	3.6	1.2	21.8
4R04	56	8.3	157.7	407.3	178.6	84.3	836.3	.1	2.8	7.3	3.2	1.5	14.9
CN03	67	0.	192.1	766.2	221.8	97.1	1277.1	0.	2.9	11.4	3.3	1.4	19.1
CN05	78	0.	179.4	482.1	194.2	175.8	1031.4	0.	2.3	6.2	2.5	2.3	13.2
EF04	137	89.0	472.7	1811.9	479.0	196.2	3048.8	.6	3.5	13.2	3.5	1.4	22.3
GN01	98	65.3	705.6	520.1	356.2	124.3	1771.5	.7	7.2	5.3	3.6	1.3	18.1
GN03	90	0.	612.0	1071.9	289.6	122.6	2096.1	0.	6.8	11.9	3.2	1.4	23.3
GN05	69	0.	441.3	1010.6	232.3	104.5	1788.7	0.	6.4	14.6	3.4	1.5	25.9
GN07	90	0.	399.0	560.3	283.6	67.5	1310.3	0.	4.4	6.2	3.2	.7	14.6
GN09	79	0.	554.3	799.2	285.8	49.2	1688.5	0.	7.0	10.1	3.6	.6	21.4
GN11	51	0.	110.5	137.6	174.4	56.7	479.1	0.	2.2	2.7	3.4	1.1	9.4
GN13	62	0.	137.4	515.8	226.4	40.1	919.7	0.	2.2	8.3	3.7	.6	14.8
L102	153	0.	504.9	618.1	493.4	252.7	1869.0	0.	3.3	4.0	3.2	1.7	12.2
L206	102	22.1	357.0	874.4	306.9	156.1	1716.5	.2	3.5	8.6	3.0	1.5	16.8
LD02	155	74.9	806.0	792.0	542.3	179.1	2394.3	.5	5.2	5.1	3.5	1.2	15.4
LD82	129	0.	1046.6	1319.9	476.4	125.4	2968.3	0.	8.1	10.2	3.7	1.0	23.0
LG06	153	0.	1498.9	995.8	549.1	186.1	3229.8	0.	9.8	6.5	3.6	1.2	21.1
LG92	108	0.	282.6	924.9	336.3	183.5	1727.3	0.	2.6	8.6	3.1	1.7	16.0
LM04	138	11.5	887.8	1169.7	439.4	208.0	2716.4	.1	6.4	8.5	3.2	1.5	19.7
LM08	68	10.2	224.4	376.1	196.8	142.5	950.0	.2	3.3	5.5	2.9	2.1	14.0

2000 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
LR02	29	0.	179.8	185.2	90.5	56.4	511.9	0.	6.2	6.4	3.1	1.9	17.7
LR04	164	0.	1157.3	1539.7	491.7	281.7	3470.3	0.	7.1	9.4	3.0	1.7	21.2
LW08	92	0.	435.5	1064.1	282.7	157.8	1940.1	0.	4.7	11.6	3.1	1.7	21.1
MN02	88	26.4	310.9	1204.0	326.2	74.9	1942.4	.3	3.5	13.7	3.7	.9	22.1
MN04	79	0.	171.2	409.9	277.4	55.8	914.2	0.	2.2	5.2	3.5	.7	11.6
FN19	21	4.6	93.1	15.5	63.7	17.0	193.8	.2	4.4	.7	3.0	.8	9.2
VN01	69	41.4	484.2	375.8	225.2	109.4	1236.0	.6	7.0	5.4	3.3	1.6	17.9
VN03	73	13.4	487.6	690.1	239.1	81.9	1512.2	.2	6.7	9.5	3.3	1.1	20.7
XN03	8	0.	27.6	124.5	25.8	4.4	182.3	0.	3.5	15.6	3.2	.5	22.8
TOTAL	3195	587.8	16375.6	27663.1	10536.0	4353.2	59515.6	.2	5.1	8.7	3.3	1.4	18.6

2000 Three-Yard Directional New Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2618	74	6.0	356.6	1134.8	235.3	133.2	1865.9	.1	4.8	15.3	3.2	1.8	25.2
2620	29	0.	70.6	257.3	57.0	86.0	471.0	0.	2.4	8.9	2.0	3.0	16.2
2622	37	1.3	99.7	313.0	85.7	98.7	598.4	.0	2.7	8.5	2.3	2.7	16.2
2624	108	21.4	400.0	1331.2	385.7	97.2	2235.6	.2	3.7	12.3	3.6	.9	20.7
2626	57	5.6	221.9	370.2	173.4	89.3	860.3	.1	3.9	6.5	3.0	1.6	15.1
2628	71	5.8	340.5	88.3	207.3	42.6	684.5	.1	4.8	1.2	2.9	.6	9.6
2630	15	1.9	65.8	206.9	30.0	35.3	339.8	.1	4.4	13.8	2.0	2.4	22.7
2632	15	1.1	67.5	186.7	26.5	48.8	330.6	.1	4.5	12.4	1.8	3.3	22.0
2636	64	11.9	240.9	455.2	186.6	99.2	993.8	.2	3.8	7.1	2.9	1.6	15.5
2672	37	2.7	160.5	273.8	82.0	103.0	622.0	.1	4.3	7.4	2.2	2.8	16.8
2674	108	0.	236.5	312.9	388.5	63.0	1000.9	0.	2.2	2.9	3.6	.6	9.3
2676	91	7.8	297.2	452.2	319.6	91.0	1167.8	.1	3.3	5.0	3.5	1.0	12.8
C-92	97	19.3	511.4	1149.4	349.6	126.1	2155.8	.2	5.3	11.8	3.6	1.3	22.2
DX04	110	35.5	740.3	1532.4	424.5	106.3	2839.0	.3	6.7	13.9	3.9	1.0	25.8
DX06	55	6.5	264.0	511.0	178.3	57.8	1017.5	.1	4.8	9.3	3.2	1.1	18.5
DX10	81	4.3	505.2	833.7	269.2	90.5	1702.9	.1	6.2	10.3	3.3	1.1	21.0
DX16	89	13.2	621.4	1077.0	340.9	5.9	2058.3	.1	7.0	12.1	3.8	.1	23.1
DX18	92	20.8	415.3	277.9	346.8	16.9	1077.5	.2	4.5	3.0	3.8	.2	11.7
DX20	116	24.5	790.7	1262.9	454.7	56.1	2588.8	.2	6.8	10.9	3.9	.5	22.3
DX72	71	4.0	609.1	404.2	236.2	97.0	1350.5	.1	8.6	5.7	3.3	1.4	19.0
DX74	103	28.6	683.0	594.1	354.6	218.0	1878.3	.3	6.6	5.8	3.4	2.1	18.2
DX76	92	27.1	400.0	606.1	316.9	116.5	1466.7	.3	4.3	6.6	3.4	1.3	15.9
DX98	81	7.4	621.5	459.6	265.0	131.0	1484.4	.1	7.7	5.7	3.3	1.6	18.3
K-02	100	12.7	388.6	1232.3	403.4	13.3	2050.4	.1	3.9	12.3	4.0	.1	20.5
N103	22	1.6	128.5	301.0	41.4	47.3	519.9	.1	5.8	13.7	1.9	2.2	23.6
N202	56	2.1	213.2	208.9	162.6	104.5	691.3	.0	3.8	3.7	2.9	1.9	12.3
N204	61	10.3	286.3	476.6	173.1	117.9	1064.2	.2	4.7	7.8	2.8	1.9	17.4
NC02	80	2.8	510.9	582.9	244.7	90.7	1431.9	.0	6.4	7.3	3.1	1.1	17.9

2000 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NC04	73	9.9	245.8	449.1	210.7	153.3	1068.8	.1	3.4	6.2	2.9	2.1	14.6
NC06	56	0.	225.4	786.0	158.7	121.3	1291.4	0.	4.0	14.0	2.8	2.2	23.1
NG01	70	14.3	423.5	577.8	219.3	137.7	1372.6	.2	6.0	8.3	3.1	2.0	19.6
NG03	66	16.5	314.8	627.7	189.9	72.6	1221.5	.3	4.8	9.5	2.9	1.1	18.5
NG05	62	31.5	423.7	893.6	170.5	139.5	1658.7	.5	6.8	14.4	2.8	2.3	26.8
NG07	74	55.5	654.2	180.2	230.0	132.0	1251.8	.8	8.8	2.4	3.1	1.8	16.9
NM03	82	9.3	436.7	673.9	262.4	147.6	1529.9	.1	5.3	8.2	3.2	1.8	18.7
NM05	103	16.8	462.8	1260.1	392.1	120.2	2251.9	.2	4.5	12.2	3.8	1.2	21.9
NP02	29	.9	139.8	408.3	73.5	62.4	684.8	.0	4.8	14.1	2.5	2.2	23.6
NV02	57	14.1	196.2	380.7	181.6	150.1	922.7	.2	3.4	6.7	3.2	2.6	16.2
NW02	93	50.1	348.9	981.2	353.4	111.6	1845.2	.5	3.8	10.6	3.8	1.2	19.8
NW04	78	16.3	267.3	680.7	238.6	148.2	1351.1	.2	3.4	8.7	3.1	1.9	17.3
NX02	28	8.2	146.4	523.3	76.5	45.3	799.7	.3	5.2	18.7	2.7	1.6	28.6
RL01	45	.2	324.3	497.2	126.8	89.3	1037.7	.0	7.2	11.0	2.8	2.0	23.1
VX02	66	6.6	369.8	262.4	196.8	117.7	953.1	.1	5.6	4.0	3.0	1.8	14.4
VX14	66	2.3	308.2	517.9	260.3	0.	1088.6	.0	4.7	7.8	3.9	0.	16.5
VX92	71	35.6	476.4	220.8	241.4	116.0	1090.2	.5	6.7	3.1	3.4	1.6	15.4
WL03	64	13.8	364.5	850.0	214.4	105.6	1548.2	.2	5.7	13.3	3.4	1.7	24.2
TOTAL	3195	587.8	16375.6	27663.1	10536.0	4353.2	59515.6	.2	5.1	8.7	3.3	1.4	18.6

2000 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNW	41	4.6	225.6	583.8	154.4	47.8	1016.2	.1	5.5	14.2	3.8	1.2	24.8
CAVE	209	12.7	982.1	1818.0	614.1	365.3	3792.1	.1	4.7	8.7	2.9	1.7	18.1
CREA	45	.2	324.3	497.2	126.8	89.3	1037.7	.0	7.2	11.0	2.8	2.0	23.1
GATE	272	117.8	1816.1	2279.2	809.8	481.7	5504.7	.4	6.7	8.4	3.0	1.8	20.2
IC	57	14.1	196.2	380.7	181.6	150.1	922.7	.2	3.4	6.7	3.2	2.6	16.2
ITC	22	1.6	128.5	301.0	41.4	47.3	519.9	.1	5.8	13.7	1.9	2.2	23.6
KTDA	31	6.5	137.9	272.5	146.2	4.1	567.2	.2	4.4	8.8	4.7	.1	18.3
KTHO	27	4.9	95.6	451.4	109.8	3.6	665.3	.2	3.5	16.7	4.1	.1	24.6
KTKL	24	0.	81.2	304.5	89.2	3.2	478.0	0.	3.4	12.7	3.7	.1	19.9
KTPK	18	1.3	74.0	204.0	58.2	2.4	339.9	.1	4.1	11.3	3.2	.1	18.9
MAD	144	21.6	673.8	1350.2	500.1	219.9	2765.6	.1	4.7	9.4	3.5	1.5	19.2
MPAR	24	7.1	145.3	234.7	82.8	11.6	481.5	.3	6.1	9.8	3.5	.5	20.1
MPDA	69	9.7	525.0	820.2	292.6	33.4	1680.7	.1	7.6	11.9	4.2	.5	24.4
MPDX	30	3.4	165.4	333.0	85.5	33.5	620.8	.1	5.5	11.1	2.9	1.1	20.7
MPFE	108	6.1	792.4	676.7	370.2	132.7	1978.1	.1	7.3	6.3	3.4	1.2	18.3
MPFW	23	7.7	120.5	208.0	79.3	11.1	426.7	.3	5.2	9.0	3.5	.5	18.6
MPHO	79	13.5	561.0	544.7	269.5	158.7	1547.4	.2	7.1	6.9	3.4	2.0	19.6
MPLA	97	24.6	642.3	816.3	372.6	72.1	1927.8	.3	6.6	8.4	3.8	.7	19.9
MPLR	158	47.9	894.7	1414.8	637.5	100.3	3095.2	.3	5.7	9.0	4.0	.6	19.6
MPMP	10	4.0	25.1	222.3	26.5	13.7	291.5	.4	2.5	22.2	2.7	1.4	29.2
MPNO	173	34.6	1021.5	1065.8	581.9	247.5	2951.2	.2	5.9	6.2	3.4	1.4	17.1
MPPB	44	8.4	260.8	395.4	133.7	23.0	821.3	.2	5.9	9.0	3.0	.5	18.7
MPSA	24	4.1	156.7	326.3	71.2	1.6	559.9	.2	6.5	13.6	3.0	.1	23.3
MPVA	51	.9	339.9	500.7	183.7	57.0	1082.2	.0	6.7	9.8	3.6	1.1	21.2
MPW	117	12.4	499.5	685.5	335.7	222.5	1755.5	.1	4.3	5.9	2.9	1.9	15.0
MRS	29	.9	139.8	408.3	73.5	62.4	684.8	.0	4.8	14.1	2.5	2.2	23.6
NWBE	34	8.2	207.7	401.9	113.9	56.1	787.8	.2	6.1	11.8	3.4	1.7	23.2
NWDK	19	5.6	82.6	294.9	63.7	31.4	478.1	.3	4.3	15.5	3.4	1.7	25.2
NWSC	11	0.	74.1	153.2	36.9	18.2	282.3	0.	6.7	13.9	3.4	1.7	25.7
NWW	171	66.4	616.2	1661.9	592.0	259.8	3196.3	.4	3.6	9.7	3.5	1.5	18.7

2000 Three-Yard Directional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
RI	97	19.3	511.4	1149.4	349.6	126.1	2155.8	.2	5.3	11.8	3.6	1.3	22.2
SFAV	31	1.1	90.7	273.8	100.8	48.1	514.4	.0	2.9	8.8	3.3	1.6	16.6
SFBL	21	3.2	88.5	275.5	52.2	32.9	452.2	.2	4.2	13.1	2.5	1.6	21.5
SFCU	29	0.	70.6	257.3	57.0	86.0	471.0	0.	2.4	8.9	2.0	3.0	16.2
SFLD	15	1.1	67.5	186.7	26.5	48.8	330.6	.1	4.5	12.4	1.8	3.3	22.0
SFMS	380	21.9	1364.3	2082.9	1271.8	386.2	5127.1	.1	3.6	5.5	3.3	1.0	13.5
SFO	15	1.9	65.8	206.9	30.0	35.3	339.8	.1	4.4	13.8	2.0	2.4	22.7
SFSF	108	21.4	400.0	1331.2	385.7	97.2	2235.6	.2	3.7	12.3	3.6	.9	20.7
SFTU	107	14.8	410.4	768.1	253.5	252.8	1699.7	.1	3.8	7.2	2.4	2.4	15.9
SSW	231	52.6	1300.8	1524.3	775.0	278.9	3931.6	.2	5.6	6.6	3.4	1.2	17.0
TOTAL	3195	587.8	16375.6	27663.1	10536.0	4353.2	59515.6	.2	5.1	8.7	3.3	1.4	18.6

2000 Three-Yard Directional New Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	316	0.	743.7	1954.4	982.2	471.8	4152.0	0.	2.4	6.2	3.1	1.5	13.1
INT-2	1088	405.9	4939.1	8647.7	3601.2	1516.1	19109.9	.4	4.5	7.9	3.3	1.4	17.6
INT-3	616	110.4	3493.7	6109.8	2018.4	902.6	12634.9	.2	5.7	9.9	3.3	1.5	20.5
INT-4	321	26.4	1909.5	3754.2	1050.1	461.1	7201.4	.1	5.9	11.7	3.3	1.4	22.4
INT-5	651	26.6	4353.1	5614.5	2222.8	725.6	12942.6	.0	6.7	8.6	3.4	1.1	19.9
INT-6	203	18.5	936.5	1582.6	661.2	276.0	3474.8	.1	4.6	7.8	3.3	1.4	17.1
TOTAL	3195	587.8	16375.6	27663.1	10536.0	4353.2	59515.6	.2	5.1	8.7	3.3	1.4	18.6

B.19 Detention Time for 1985 Three-Yard Bidirectional Yard By:

Inbound Road

Outbound Road

Inbound Train

Outbound Train

Outbound Classifications

Time of Day Interval

1985 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	115	10.2	237.5	1290.4	323.8	116.6	1978.4	.1	2.1	11.2	2.8	1.0	17.2
CNW	303	0.	1046.8	2867.7	867.1	324.7	5106.2	0.	3.5	9.5	2.9	1.1	16.9
CR	240	5.1	598.2	1851.3	691.1	238.2	3383.9	.0	2.5	7.7	2.9	1.0	14.1
CRIP	97	43.7	237.7	900.5	289.3	90.1	1561.2	.5	2.5	9.3	3.0	.9	16.1
ICG	55	9.2	138.4	397.4	157.4	59.8	762.2	.2	2.5	7.2	2.9	1.1	13.9
ITC	56	0.	120.4	796.7	157.1	54.0	1128.2	0.	2.2	14.2	2.8	1.0	20.1
LN	46	24.5	114.2	350.5	132.4	47.5	669.1	.5	2.5	7.6	2.9	1.0	14.5
MKT	62	0.	236.6	724.7	175.6	64.4	1201.4	0.	3.8	11.7	2.8	1.0	19.4
MP	217	0.	628.4	2665.0	656.0	185.2	4134.6	0.	2.9	12.3	3.0	.9	19.1
MRS	13	5.0	25.8	106.7	32.4	19.5	189.3	.4	2.0	8.2	2.5	1.5	14.6
NW	256	27.6	595.2	2993.9	714.4	255.5	4586.6	.1	2.3	11.7	2.8	1.0	17.9
NWYD	4	1.3	4.1	90.0	11.6	1.3	108.3	.3	1.0	22.5	2.9	.3	27.1
SLSF	663	24.6	1970.0	6476.0	1962.1	611.1	11043.8	.0	3.0	9.8	3.0	.9	16.7
TRRA	188	16.1	444.8	1681.2	522.2	208.9	2873.1	.1	2.4	8.9	2.8	1.1	15.3
TOTAL	2315	167.1	6398.2	23191.9	6692.2	2276.7	38726.1	.1	2.8	10.0	2.9	1.0	16.7

1985 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BO	187	16.9	540.0	1832.4	541.2	181.7	3112.2	.1	2.9	9.8	2.9	1.0	16.6
CNW	46	2.6	150.6	569.0	112.7	71.3	906.2	.1	3.3	12.4	2.5	1.6	19.7
CR	200	19.7	646.8	2187.6	611.6	144.0	3609.7	.1	3.2	10.9	3.1	.7	18.0
CRIP	73	4.5	154.8	890.5	215.4	76.7	1341.8	.1	2.1	12.2	3.0	1.1	18.4
LN	179	15.5	454.2	1638.3	510.9	160.7	2779.6	.1	2.5	9.2	2.9	.9	15.5
MKT	87	6.6	184.3	1104.9	303.2	29.0	1628.1	.1	2.1	12.7	3.5	.3	18.7
MP	72	4.6	207.6	1058.2	204.2	70.8	1545.3	.1	2.9	14.7	2.8	1.0	21.5
NW	29	1.4	80.5	347.3	83.1	31.4	543.7	.0	2.8	12.0	2.9	1.1	18.7
NWYD	657	24.2	1877.6	5708.7	2044.6	573.9	10229.0	.0	2.9	8.7	3.1	.9	15.6
SLSF	380	26.4	907.7	3486.4	947.6	517.7	5885.8	.1	2.4	9.2	2.5	1.4	15.5
SOU	105	22.8	283.5	1263.6	289.0	98.6	1957.5	.2	2.7	12.0	2.8	.9	18.6
TRRA	300	21.9	910.5	3105.1	828.8	321.0	5187.3	.1	3.0	10.4	2.8	1.1	17.3
TOTAL	2315	167.1	6398.2	23191.9	6692.2	2276.7	38726.1	.1	2.8	10.0	2.9	1.0	16.7

1985 Three-Yard Bidirectional New Yard

Inbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-502	147	0.	472.4	954.0	441.4	144.0	2011.9	0.	3.2	6.5	3.0	1.0	13.7
-C01	97	43.7	237.7	900.5	289.3	90.1	1561.2	.5	2.5	9.3	3.0	.9	16.1
-K01	62	0.	236.6	724.7	175.6	64.4	1201.4	0.	3.8	11.7	2.8	1.0	19.4
-L02	98	0.	243.4	786.9	270.7	115.3	1416.3	0.	2.5	8.0	2.8	1.2	14.5
2N11	32	0.	110.9	456.5	87.8	28.7	683.9	0.	3.5	14.3	2.7	.9	21.4
4R06	12	2.4	25.4	58.2	22.2	25.8	134.0	.2	2.1	4.9	1.9	2.2	11.2
5G02	156	0.	574.4	1913.6	425.6	180.6	3094.3	0.	3.7	12.3	2.7	1.2	19.8
6207	43	0.	91.7	178.3	130.3	38.6	438.9	0.	2.1	4.1	3.0	.9	10.2
6209	26	0.	39.0	275.2	78.8	25.4	418.4	0.	1.5	10.6	3.0	1.0	16.1
6211	102	0.	380.8	1094.9	262.2	131.9	1869.8	0.	3.7	10.7	2.6	1.3	18.3
6213	81	0.	303.8	1140.3	225.2	81.8	1751.1	0.	3.8	14.1	2.8	1.0	21.6
6215	102	1.7	256.7	848.9	346.3	54.1	1507.7	.0	2.5	8.3	3.4	.5	14.8
6219	62	0.	131.2	541.2	171.1	70.5	914.1	0.	2.1	8.7	2.8	1.1	14.7
6221	102	8.5	311.1	940.3	299.6	93.4	1652.9	.1	3.1	9.2	2.9	.9	16.2
6223	37	0.	56.1	274.0	110.2	32.9	473.1	0.	1.5	7.4	3.0	.9	12.8
6225	108	14.4	399.6	1182.9	338.5	82.5	2017.8	.1	3.7	11.0	3.1	.8	18.7
6M01	87	0.	274.1	1421.6	297.6	41.2	2034.4	0.	3.2	16.3	3.4	.5	23.4
7N25	56	0.	120.4	796.7	157.1	54.0	1128.2	0.	2.2	14.2	2.8	1.0	20.1
CN10	51	0.	136.0	548.8	136.8	54.5	876.1	0.	2.7	10.8	2.7	1.1	17.2
CN18	46	0.	76.7	486.3	132.9	52.7	748.5	0.	1.7	10.6	2.9	1.1	16.3
EF04	46	24.5	114.2	350.5	132.4	47.5	669.1	.5	2.5	7.6	2.9	1.0	14.5
GN14	29	10.2	42.5	343.8	80.9	28.4	505.8	.4	1.5	11.9	2.8	1.0	17.4
GN22	86	0.	194.9	946.6	242.8	88.2	1472.6	0.	2.3	11.0	2.8	1.0	17.1
L102	122	0.	364.0	818.9	371.2	104.6	1658.7	0.	3.0	6.7	3.0	.9	13.6
L206	74	0.	160.3	727.0	203.5	81.0	1171.9	0.	2.2	9.8	2.7	1.1	15.8
LM04	32	2.7	48.5	247.2	94.2	26.8	419.3	.1	1.5	7.7	2.9	.8	13.1
LW08	70	0.	186.7	721.7	183.0	82.1	1173.5	0.	2.7	10.3	2.6	1.2	16.8
MN18	46	16.1	118.8	325.4	124.6	51.4	636.3	.4	2.6	7.1	2.7	1.1	13.8
MN26	45	0.	113.3	320.8	127.9	50.3	612.2	0.	2.5	7.1	2.8	1.1	13.6
PN13	13	5.0	25.8	106.7	32.4	19.5	189.3	.4	2.0	8.2	2.5	1.5	14.6
VN23	55	9.2	138.4	397.4	157.4	59.8	762.2	.2	2.5	7.2	2.9	1.1	13.9
WN11	48	11.2	103.2	435.0	122.1	69.4	740.9	.2	2.2	9.1	2.5	1.4	15.4
WN16	82	16.4	203.6	1204.4	243.5	49.6	1717.4	.2	2.5	14.7	3.0	.6	20.9
WN21	56	0.	101.7	632.8	165.8	54.4	954.7	0.	1.8	11.3	3.0	1.0	17.0
XN30	4	1.3	4.1	90.0	11.6	1.3	108.3	.3	1.0	22.5	2.9	.3	27.1
TOTAL	2315	167.1	6398.2	23191.9	6692.2	2276.7	38726.1	.1	2.8	10.0	2.9	1.0	16.7

1985 Three-Yard Bidirectional New Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2618	30	.3	77.0	291.7	62.0	38.0	469.0	.0	2.6	9.7	2.1	1.3	15.6
2620	62	3.1	139.5	514.5	181.4	59.9	898.4	.0	2.3	8.3	2.9	1.0	14.5
2622	30	.1	70.0	179.4	62.0	52.0	363.5	.0	2.3	6.0	2.1	1.7	12.1
2624	11	2.0	24.8	143.7	17.2	26.8	214.5	.2	2.3	13.1	1.6	2.4	19.5
2626	38	6.5	95.6	333.4	82.3	69.7	587.5	.2	2.5	8.8	2.2	1.8	15.5
2628	42	.2	121.4	431.8	95.9	63.0	712.2	.0	2.9	10.3	2.3	1.5	17.0
2632	68	3.2	141.5	327.2	199.0	60.1	730.9	.0	2.1	4.8	2.9	.9	10.7
2672	41	4.2	121.6	420.7	95.0	69.0	710.6	.1	3.0	10.3	2.3	1.7	17.3
2674	58	6.8	116.3	844.1	152.7	79.3	1199.3	.1	2.0	14.6	2.6	1.4	20.7
3-01	51	2.6	135.2	356.7	129.2	78.2	701.9	.1	2.7	7.0	2.5	1.5	13.8
3-03	77	9.2	185.0	1150.5	252.5	7.7	1604.9	.1	2.4	14.9	3.3	.1	20.8
5-03	46	2.6	150.6	569.0	112.7	71.3	906.2	.1	3.3	12.4	2.5	1.6	19.7
C-92	73	4.5	154.8	890.5	215.4	76.7	1341.8	.1	2.1	12.2	3.0	1.1	18.4
E471	62	6.7	195.3	465.4	182.6	49.6	899.5	.1	3.1	7.5	2.9	.8	14.5
E491	65	2.2	173.0	605.0	180.9	79.1	1040.2	.0	2.7	9.3	2.8	1.2	16.0
E493	60	8.1	171.7	762.0	177.7	53.0	1172.5	.1	2.9	12.7	3.0	.9	19.5
G301	51	3.7	134.0	131.1	129.2	74.8	472.8	.1	2.6	2.6	2.5	1.5	9.3
GL44	63	3.4	189.0	567.1	181.7	43.1	984.3	.1	3.0	9.0	2.9	.7	15.6
GR46	66	5.2	216.1	1057.4	192.7	56.1	1527.4	.1	3.3	16.0	2.9	.8	23.1
K-02	87	6.6	184.3	1104.9	303.2	29.0	1628.1	.1	2.1	12.7	3.5	.3	18.7
L-01	72	4.6	207.6	1058.2	204.2	70.8	1545.3	.1	2.9	14.7	2.8	1.0	21.5
N219	60	3.2	159.7	651.0	165.3	73.0	1052.2	.1	2.7	10.8	2.8	1.2	17.5
N714	44	2.0	122.2	415.1	104.9	71.1	715.3	.0	2.8	9.4	2.4	1.6	16.3
NC19	90	2.5	234.1	347.4	283.1	70.5	937.5	.0	2.6	3.9	3.1	.8	10.4
NC29	42	.1	154.5	286.1	95.9	72.1	608.7	.0	3.7	6.8	2.3	1.7	14.5
NC44	31	0.	86.8	274.8	64.1	48.6	474.2	0.	2.8	8.9	2.1	1.6	15.3
NG22	39	2.8	118.3	395.6	86.5	46.2	649.2	.1	3.0	10.1	2.2	1.2	16.6
NM12	100	1.0	258.8	506.3	363.3	36.7	1166.1	.0	2.6	5.1	3.6	.4	11.7
NM24	16	3.1	33.4	79.8	29.6	34.4	180.2	.2	2.1	5.0	1.9	2.2	11.3
NF10	22	.0	67.0	147.5	48.8	39.2	302.5	.0	3.0	6.7	2.2	1.8	13.7
NV26	117	2.8	378.1	1781.8	490.8	0.	2653.6	.0	3.2	15.2	4.2	0.	22.7

1985 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NW13	83	5.2	236.5	513.7	273.9	58.1	1087.3	.1	2.8	6.2	3.3	.7	13.1
NX22	44	1.5	115.2	584.6	102.7	72.6	876.5	.0	2.6	13.3	2.3	1.7	19.9
R403	60	4.1	203.7	613.2	158.8	73.0	1052.8	.1	3.4	10.2	2.6	1.2	17.5
R409	74	9.9	231.2	528.4	229.4	66.6	1065.5	.1	3.1	7.1	3.1	.9	14.4
R471	66	5.7	211.9	1046.0	223.4	4.4	1491.4	.1	3.2	15.8	3.4	.1	22.6
S-01	53	12.3	137.0	678.9	133.4	81.3	1042.8	.2	2.6	12.8	2.5	1.5	19.7
S-03	52	10.5	146.6	584.7	155.6	17.3	914.8	.2	2.8	11.2	3.0	.3	17.6
S-44	43	11.0	107.8	422.4	137.7	38.0	716.8	.3	2.5	9.8	3.2	.9	16.7
S-48	55	0.	188.7	415.1	153.1	68.8	825.6	0.	3.4	7.5	2.8	1.3	15.0
WL03	29	1.4	80.5	347.3	83.1	31.4	543.7	.0	2.8	12.0	2.9	1.1	18.7
WL43	42	2.4	122.2	368.4	99.5	66.5	659.0	.1	2.9	8.8	2.4	1.6	15.7
TOTAL	2315	167.1	6398.2	23191.9	6692.2	2276.7	38726.1	.1	2.8	10.0	2.9	1.0	16.7

1985 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BNGL	63	3.4	189.0	567.1	181.7	43.1	984.3	.1	3.0	9.0	2.9	.7	15.6
BOC	60	8.1	171.7	762.0	177.7	53.0	1172.5	.1	2.9	12.7	3.0	.9	19.5
BOL	65	2.2	173.0	605.0	180.9	79.1	1040.2	.0	2.7	9.3	2.8	1.2	16.0
BOT	62	6.7	195.3	465.4	182.6	49.6	899.5	.1	3.1	7.5	2.9	.8	14.5
CAVE	132	2.6	388.6	633.5	379.0	142.6	1546.2	.0	2.9	4.8	2.9	1.1	11.7
CRAN	66	5.2	216.1	1057.4	192.7	56.1	1527.4	.1	3.3	16.0	2.9	.8	23.1
CRC	74	9.9	231.2	528.4	229.4	66.6	1065.5	.1	3.1	7.1	3.1	.9	14.4
CREN	60	4.1	203.7	613.2	158.8	73.0	1052.8	.1	3.4	10.2	2.6	1.2	17.5
CRST	66	5.7	211.9	1046.0	223.4	4.4	1491.4	.1	3.2	15.8	3.4	.1	22.6
CWFK	27	.3	89.0	316.9	66.2	41.9	514.2	.0	3.3	11.7	2.5	1.6	19.0
CWVO	19	2.2	61.6	252.2	46.6	29.5	392.0	.1	3.2	13.3	2.5	1.6	20.6
GATE	39	2.8	118.3	395.6	86.5	46.2	649.2	.1	3.0	10.1	2.2	1.2	16.6
IC	117	2.8	378.1	1781.8	490.8	0.	2653.6	.0	3.2	15.2	4.2	0.	22.7
IND	31	0.	86.8	274.8	64.1	48.6	474.2	0.	2.8	8.9	2.1	1.6	15.3
ITC	44	2.0	122.2	415.1	104.9	71.1	715.3	.0	2.8	9.4	2.4	1.6	16.3
KTDA	30	1.5	69.4	387.7	120.5	10.0	589.2	.1	2.3	12.9	4.0	.3	19.6
KTHO	18	1.3	40.1	277.3	63.6	6.0	388.3	.1	2.2	15.4	3.5	.3	21.6
KTKL	19	1.1	39.2	244.8	61.1	6.3	352.5	.1	2.1	12.9	3.2	.3	18.6
KTFK	20	2.7	35.7	195.1	58.0	6.7	298.1	.1	1.8	9.8	2.9	.3	14.9
LNEV	77	9.2	185.0	1150.5	252.5	7.7	1604.9	.1	2.4	14.9	3.3	.1	20.8
LNNA	102	6.3	269.2	487.8	258.4	153.0	1174.7	.1	2.6	4.8	2.5	1.5	11.5
MAD	116	4.1	292.1	586.1	392.9	71.1	1346.3	.0	2.5	5.1	3.4	.6	11.6
MFCH	43	.9	124.3	624.3	129.7	42.3	921.5	.0	2.9	14.5	3.0	1.0	21.4
MFVG	29	3.7	83.3	433.9	74.4	28.5	623.8	.1	2.9	15.0	2.6	1.0	21.5
MFW	60	3.2	159.7	651.0	165.3	73.0	1052.2	.1	2.7	10.8	2.8	1.2	17.5
MRS	22	.0	67.0	147.5	48.8	39.2	302.5	.0	3.0	6.7	2.2	1.8	13.7
NWBE	13	2.1	41.5	98.1	29.5	20.6	191.7	.2	3.2	7.5	2.3	1.6	14.7
NWCH	10	.3	27.6	131.2	27.7	10.8	197.6	.0	2.8	13.1	2.8	1.1	19.8
NWDK	29	.3	80.8	270.3	70.1	45.9	467.4	.0	2.8	9.3	2.4	1.6	16.1
NWDT	19	1.1	52.9	216.1	55.4	20.6	346.1	.1	2.8	11.4	2.9	1.1	18.2
NWW	83	5.2	236.5	513.7	273.9	58.1	1087.3	.1	2.8	6.2	3.3	.7	13.1
RI	73	4.5	154.8	890.5	215.4	76.7	1341.8	.1	2.1	12.2	3.0	1.1	18.4

1985 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
SFAV	41	4.2	121.6	420.7	95.0	69.0	710.6	.1	3.0	10.3	2.3	1.7	17.3
SFCU	38	6.5	95.6	333.4	82.3	69.7	587.5	.2	2.5	8.8	2.2	1.8	15.5
SFIR	30	.3	77.0	291.7	62.0	38.0	469.0	.0	2.6	9.7	2.1	1.3	15.6
SFLD	11	2.0	24.8	143.7	17.2	26.8	214.5	.2	2.3	13.1	1.6	2.4	19.5
SFMS	98	3.3	211.6	506.6	261.0	112.1	1094.4	.0	2.2	5.2	2.7	1.1	11.2
SFPA	42	.2	121.4	431.8	95.9	63.0	712.2	.0	2.9	10.3	2.3	1.5	17.0
SFSF	58	6.8	116.3	844.1	152.7	79.3	1199.3	.1	2.0	14.6	2.6	1.4	20.7
SFTU	62	3.1	139.5	514.5	181.4	59.9	898.4	.0	2.3	8.3	2.9	1.0	14.5
SDCG	52	10.5	146.6	584.7	155.6	17.3	914.8	.2	2.8	11.2	3.0	.3	17.6
SOKN	55	0.	188.7	415.1	153.1	68.8	825.6	0.	3.4	7.5	2.8	1.3	15.0
SOMA	53	12.3	137.0	678.9	133.4	81.3	1042.8	.2	2.6	12.8	2.5	1.5	19.7
SOPR	43	11.0	107.8	422.4	137.7	38.0	716.8	.3	2.5	9.8	3.2	.9	16.7
SSW	44	1.5	115.2	584.6	102.7	72.6	876.5	.0	2.6	13.3	2.3	1.7	19.9
TOTAL	2315	167.1	6398.2	23191.9	6692.2	2276.7	38726.1	.1	2.8	10.0	2.9	1.0	16.7

1985 Three-Yard Bidirectional New Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	386	1.7	1060.1	3298.3	1167.4	340.8	5868.4	.0	2.7	8.5	3.0	.9	15.2
INT-2	557	77.3	1360.8	4689.1	1618.4	558.2	8303.9	.1	2.4	8.4	2.9	1.0	14.9
INT-3	345	11.2	881.4	2874.4	977.8	356.2	5100.9	.0	2.6	8.3	2.8	1.0	14.8
INT-4	382	10.2	1203.8	4358.0	1045.5	427.9	7045.3	.0	3.2	11.4	2.7	1.1	18.4
INT-5	294	14.9	947.2	3869.9	854.2	284.1	5970.1	.1	3.2	13.2	2.9	1.0	20.3
INT-6	351	51.9	944.9	4102.3	1028.9	309.6	6437.5	.1	2.7	11.7	2.9	.9	18.3
TOTAL	2315	167.1	6398.2	23191.9	6692.2	2276.7	38726.1	.1	2.8	10.0	2.9	1.0	16.7

B.20 Detention Time for 2000 Three-Yard Bidirectional New Yard By:

- Inbound Road
- Outbound Road
- Inbound Train
- Outbound Train
- Outbound Classifications
- Time of Day Interval

2000 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
AS	168	28.6	436.2	2218.4	583.2	165.4	3431.8	.2	2.6	13.2	3.5	1.0	20.4
CNW	252	0.	800.0	2248.2	829.3	324.2	4201.7	0.	3.2	8.9	3.3	1.3	16.7
CR	332	55.0	1193.9	2269.7	1145.1	365.1	5028.7	.2	3.6	6.8	3.4	1.1	15.1
CRIP	149	77.0	531.4	1106.1	568.4	106.1	2389.0	.5	3.6	7.4	3.8	.7	16.0
ICG	77	15.4	227.2	715.9	249.4	88.2	1296.0	.2	3.0	9.3	3.2	1.1	16.8
ITC	89	0.	206.2	1351.1	308.8	75.4	1941.5	0.	2.3	15.2	3.5	.8	21.8
LN	54	39.6	202.5	616.8	201.4	46.8	1107.1	.7	3.8	11.4	3.7	.9	20.5
MKT	74	1.2	320.7	804.8	278.2	48.1	1453.0	.0	4.3	10.9	3.8	.7	19.6
MP	264	14.5	943.0	3021.2	945.1	227.0	5150.8	.1	3.6	11.4	3.6	.9	19.5
MRS	23	10.4	41.0	174.4	67.5	45.5	338.7	.5	1.8	7.6	2.9	2.0	14.7
NW	322	8.1	1139.7	3705.1	1199.7	257.3	6310.0	.0	3.5	11.5	3.7	.8	19.6
NWYD	6	2.4	15.7	131.0	19.4	0.	168.5	.4	2.6	21.8	3.2	0.	28.1
SLSF	1000	73.8	3517.9	10493.6	3842.7	735.7	18663.7	.1	3.5	10.5	3.8	.7	18.7
TRRA	304	28.0	824.5	2203.3	1054.7	334.9	4445.3	.1	2.7	7.2	3.5	1.1	14.6
TOTAL	3114	354.0	10399.9	31059.6	11292.8	2819.6	55925.8	.1	3.3	10.0	3.6	.9	18.0

2000 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Road	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
BO	284	32.0	1000.2	2494.7	1144.7	155.6	4827.1	.1	3.5	8.8	4.0	.5	17.0
CNW	76	5.6	270.2	1055.2	247.0	133.0	1711.0	.1	3.6	13.9	3.3	1.8	22.5
CR	309	31.8	1097.8	3614.2	1172.5	218.8	6135.0	.1	3.6	11.7	3.8	.7	19.9
CRIP	92	5.4	241.2	1260.8	318.7	41.4	1867.4	.1	2.6	13.7	3.5	.5	20.3
LN	252	12.7	790.3	2234.6	951.6	153.1	4142.2	.1	3.1	8.9	3.8	.6	16.4
MKT	117	13.4	328.4	1931.9	518.6	0.	2792.2	.1	2.8	16.5	4.4	0.	23.9
MP	116	12.2	396.3	1521.0	431.0	125.7	2486.2	.1	3.4	13.1	3.7	1.1	21.4
NW	46	4.2	188.0	456.2	169.1	32.2	849.7	.1	4.1	9.9	3.7	.7	18.5
NWYD	780	68.1	2665.4	7528.9	2814.7	788.0	13864.9	.1	3.4	9.7	3.6	1.0	17.8
SLSF	545	62.3	1715.8	4957.9	1620.6	934.7	9291.2	.1	3.1	9.1	3.0	1.7	17.0
SOU	124	37.8	422.7	1191.8	410.9	115.3	2178.5	.3	3.4	9.6	3.3	.9	17.6
TRRA	373	68.5	1283.8	2812.6	1493.6	121.9	5780.4	.2	3.4	7.5	4.0	.3	15.5
TOTAL	3114	354.0	10399.9	31059.6	11292.8	2819.6	55925.8	.1	3.3	10.0	3.6	.9	18.0

2000 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
-502	114	0.	307.8	938.1	378.9	151.6	1776.3	0.	2.7	8.2	3.3	1.3	15.6
-C01	149	77.0	531.4	1106.1	568.4	106.1	2389.0	.5	3.6	7.4	3.8	.7	16.0
-K01	74	1.2	320.7	804.8	278.2	48.1	1453.0	.0	4.3	10.9	3.8	.7	19.6
-L02	102	0.	307.7	777.0	373.8	85.4	1543.9	0.	3.0	7.6	3.7	.8	15.1
2N11	58	14.5	234.9	701.2	211.3	46.5	1208.4	.3	4.1	12.1	3.6	.8	20.8
4R06	16	0.	59.7	210.9	67.2	12.8	350.7	0.	3.7	13.2	4.2	.8	21.9
5G02	138	0.	492.2	1310.2	450.4	172.7	2425.4	0.	3.6	9.5	3.3	1.3	17.6
6207	78	18.2	399.1	691.7	265.8	103.3	1478.1	.2	5.1	8.9	3.4	1.3	19.0
6209	44	0.	176.7	487.7	177.0	24.4	865.8	0.	4.0	11.1	4.0	.6	19.7
6211	113	0.	425.6	1277.5	417.3	78.0	2198.4	0.	3.8	11.3	3.7	.7	19.5
6213	120	0.	542.0	1795.7	443.8	69.8	2851.3	0.	4.5	15.0	3.7	.6	23.8
6215	101	1.7	252.5	934.8	408.7	59.2	1656.8	.0	2.5	9.3	4.0	.6	16.4
6219	98	0.	307.1	1387.7	356.1	99.6	2150.4	0.	3.1	14.2	3.6	1.0	21.9
6221	130	19.5	489.7	932.3	506.6	60.9	2009.0	.2	3.8	7.2	3.9	.5	15.5
6223	32	0.	61.9	409.9	121.2	24.6	617.5	0.	1.9	12.8	3.8	.8	19.3
6225	100	18.3	358.3	1082.1	369.5	74.0	1902.3	.2	3.6	10.8	3.7	.7	19.0
6283	54	.9	121.5	492.7	163.8	96.0	875.0	.0	2.3	9.1	3.0	1.8	16.2
6285	130	15.2	383.5	1001.5	613.0	46.0	2059.2	.1	3.0	7.7	4.7	.4	15.8
6H01	104	0.	400.4	1543.1	360.0	95.0	2398.5	0.	3.9	14.8	3.5	.9	23.1
7N25	89	0.	206.2	1351.1	308.8	75.4	1941.5	0.	2.3	15.2	3.5	.8	21.8
CN10	101	0.	267.7	788.0	334.5	140.9	1531.0	0.	2.7	7.8	3.3	1.4	15.2
CN18	61	0.	114.9	591.4	228.5	37.7	972.4	0.	1.9	9.7	3.7	.6	15.9
EF04	54	39.6	202.5	616.8	201.4	46.8	1107.1	.7	3.8	11.4	3.7	.9	20.5
GN14	78	28.6	226.2	1047.8	246.1	109.3	1658.1	.4	2.9	13.4	3.2	1.4	21.3
GN22	90	0.	210.0	1170.6	337.1	56.1	1773.7	0.	2.3	13.0	3.7	.6	19.7

2000 Three- Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Inbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
L102	143	11.9	505.3	643.1	532.1	131.2	1823.5	.1	3.5	4.5	3.7	.9	12.8
L206	97	0.	400.9	677.9	324.5	126.6	1529.9	0.	4.1	7.0	3.3	1.3	15.8
LM04	76	43.1	228.0	737.8	221.4	94.5	1324.7	.6	3.0	9.7	2.9	1.2	17.4
LW08	67	0.	280.3	652.7	255.2	61.6	1249.8	0.	4.2	9.7	3.8	.9	18.7
MN18	73	28.0	257.9	400.3	257.8	70.7	1014.6	.4	3.5	5.5	3.5	1.0	13.9
MN26	69	0.	184.0	423.7	234.0	85.5	927.2	0.	2.7	6.1	3.4	1.2	13.4
FN13	23	10.4	41.0	174.4	67.5	45.5	338.7	.5	1.8	7.6	2.9	2.0	14.7
VN23	77	15.4	227.2	715.9	249.4	88.2	1296.0	.2	3.0	9.3	3.2	1.1	16.8
WN11	61	8.1	175.9	544.1	220.3	52.8	1001.2	.1	2.9	8.9	3.6	.9	16.4
WN16	114	0.	490.2	1678.8	434.7	75.8	2679.4	0.	4.3	14.7	3.8	.7	23.5
WN21	80	0.	193.3	829.6	289.5	67.2	1379.6	0.	2.4	10.4	3.6	.8	17.2
XN30	6	2.4	15.7	131.0	19.4	0.	168.5	.4	2.6	21.8	3.2	0.	28.1
TOTAL	3114	354.0	10399.9	31059.6	11292.8	2819.6	55925.8	.1	3.3	10.0	3.6	.9	18.0

2000 Three- Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Train	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
2618	27	.6	85.9	211.8	77.8	46.8	423.0	.0	3.2	7.8	2.9	1.7	15.7
2620	96	10.5	314.2	961.5	338.1	86.4	1710.7	.1	3.3	10.0	3.5	.9	17.8
2622	28	0.	74.2	63.9	53.7	86.3	278.1	0.	2.7	2.3	1.9	3.1	9.9
2624	38	10.4	114.0	392.8	95.0	95.0	707.3	.3	3.0	10.3	2.5	2.5	18.6
2626	56	10.1	189.4	382.3	150.5	123.2	855.4	.2	3.4	6.8	2.7	2.2	15.3
2628	63	3.8	186.9	564.6	191.4	110.3	1057.0	.1	3.0	9.0	3.0	1.8	16.8
2632	88	6.6	307.9	624.3	278.8	118.8	1336.3	.1	3.5	7.1	3.2	1.4	15.2
2672	65	8.6	189.6	594.8	183.1	141.9	1117.9	.1	2.9	9.2	2.8	2.2	17.2
2674	84	11.8	253.7	1161.8	252.2	126.0	1805.5	.1	3.0	13.8	3.0	1.5	21.5
3-01	60	1.2	165.3	456.0	158.0	142.0	922.4	.0	2.8	7.6	2.6	2.4	15.4
3-03	103	6.2	358.0	1408.0	464.4	5.2	2241.6	.1	3.5	13.7	4.5	.0	21.8
5-03	76	5.6	270.2	1055.2	247.0	133.0	1711.0	.1	3.6	13.9	3.3	1.8	22.5
C-92	92	5.4	241.2	1260.8	318.7	41.4	1867.4	.1	2.6	13.7	3.5	.5	20.3
E471	93	16.3	357.4	580.6	356.3	18.6	1329.2	.2	3.8	6.2	3.8	.2	14.3
E491	99	0.	325.3	744.0	358.1	137.0	1564.3	0.	3.3	7.5	3.6	1.4	15.8
E493	92	15.7	317.5	1170.0	430.4	0.	1933.7	.2	3.5	12.7	4.7	0.	21.0
G301	89	5.3	267.1	370.6	329.2	5.9	978.1	.1	3.0	4.2	3.7	.1	11.0
GL44	101	12.1	371.9	820.9	404.1	6.7	1615.7	.1	3.7	8.1	4.0	.1	16.0
GR46	105	9.2	319.2	772.1	508.4	0.	1608.9	.1	3.0	7.4	4.8	0.	15.3
K-02	117	13.4	328.4	1931.9	518.6	0.	2792.2	.1	2.8	16.5	4.4	0.	23.9
L-01	116	12.2	396.3	1521.0	431.0	125.7	2486.2	.1	3.4	13.1	3.7	1.1	21.4
N219	63	4.9	189.4	597.1	250.6	9.5	1051.5	.1	3.0	9.5	4.0	.2	16.7
N714	68	6.0	242.5	719.3	261.6	32.9	1262.3	.1	3.6	10.6	3.8	.5	18.6
NC19	92	10.0	312.8	445.1	313.7	78.2	1159.8	.1	3.4	4.8	3.4	.8	12.6
NC29	78	11.0	318.1	594.9	233.8	146.9	1304.7	.1	4.1	7.6	3.0	1.9	16.7
NC44	42	23.8	126.0	156.1	102.2	70.7	478.8	.6	3.0	3.7	2.4	1.7	11.4
NG22	61	6.5	206.8	559.6	205.3	30.5	1008.7	.1	3.4	9.2	3.4	.5	16.5

2000 Three-Yard Bidirectional New Yard

Outbound Train	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NM12	120	.6	355.6	1294.1	504.0	96.0	2250.3	.0	3.0	10.8	4.2	.8	18.8
NP10	17	.1	53.4	158.5	51.6	26.9	290.4	.0	3.1	9.3	3.0	1.6	17.1
NV26	99	6.3	376.6	1444.0	353.7	107.3	2287.7	.1	3.8	14.6	3.6	1.1	23.1
NW13	116	17.7	413.4	871.7	450.6	125.7	1879.0	.2	3.6	7.5	3.9	1.1	16.2
NX22	66	5.1	196.9	844.5	189.8	134.2	1370.6	.1	3.0	12.8	2.9	2.0	20.8
R403	92	9.2	336.7	747.6	315.3	124.2	1533.0	.1	3.7	8.1	3.4	1.4	16.7
R409	112	13.3	383.0	1322.6	456.5	85.9	2261.3	.1	3.4	11.8	4.1	.8	20.2
R471	105	9.3	378.1	1544.1	400.6	8.8	2340.8	.1	3.6	14.7	3.8	.1	22.3
S-01	70	20.5	236.4	908.3	250.7	39.7	1455.5	.3	3.4	13.0	3.6	.6	20.8
S-03	54	17.4	186.3	283.5	160.2	75.6	723.0	.3	3.5	5.3	3.0	1.4	13.4
S-44	55	18.6	183.6	513.0	181.8	42.2	939.1	.3	3.3	9.3	3.3	.8	17.1
WL03	46	4.2	188.0	456.2	169.1	32.2	849.7	.1	4.1	9.9	3.7	.7	18.5
WL43	70	4.9	283.1	550.6	297.2	2.3	1138.0	.1	4.0	7.9	4.2	.0	16.3
TOTAL	3114	354.0	10399.9	31059.6	11292.8	2819.6	55925.8	.1	3.3	10.0	3.6	.9	18.0

2000 Three-Yard Bidirectional New Yard

		Aggregate Car Hours						Average Car Hours/Car					
Outbound Classification	Number of Cars	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
RNGL	101	12.1	371.9	820.9	404.1	6.7	1615.7	.1	3.7	8.1	4.0	.1	16.0
ROC	92	15.7	317.5	1170.0	430.4	0.	1933.7	.2	3.5	12.7	4.7	0.	21.0
ROL	99	0.	325.3	744.0	358.1	137.0	1564.3	0.	3.3	7.5	3.6	1.4	15.8
BOT	93	16.3	357.4	580.6	356.3	18.6	1329.2	.2	3.8	6.2	3.8	.2	14.3
CAVE	170	21.0	630.9	1040.0	547.5	225.1	2464.5	.1	3.7	6.1	3.2	1.3	14.5
CRAN	105	9.2	319.2	772.1	508.4	0.	1608.9	.1	3.0	7.4	4.8	0.	15.3
CRC	112	13.3	383.0	1322.6	456.5	85.9	2261.3	.1	3.4	11.8	4.1	.8	20.2
CREN	92	9.2	336.7	747.6	315.3	124.2	1533.0	.1	3.7	8.1	3.4	1.4	16.7
CRST	105	9.3	378.1	1544.1	400.6	8.8	2340.8	.1	3.6	14.7	3.8	.1	22.3
CWPK	44	1.1	151.5	694.4	143.0	77.0	1067.0	.0	3.4	15.8	3.3	1.8	24.2
CWVO	32	4.5	118.7	360.8	104.0	56.0	644.0	.1	3.7	11.3	3.3	1.8	20.1
GATE	61	6.5	206.8	559.6	205.3	30.5	1008.7	.1	3.4	9.2	3.4	.5	16.5
IC	99	6.3	376.6	1444.0	353.7	107.3	2287.7	.1	3.8	14.6	3.6	1.1	23.1
IND	42	23.8	126.0	156.1	102.2	70.7	478.8	.6	3.0	3.7	2.4	1.7	11.4
ITC	68	6.0	242.5	719.3	261.6	32.9	1262.3	.1	3.6	10.6	3.8	.5	18.6
KTDA	38	1.8	112.8	460.3	198.2	0.	773.1	.0	3.0	12.1	5.2	0.	20.3
KTHO	27	1.4	75.3	495.5	131.0	0.	703.1	.1	2.8	18.4	4.8	0.	26.0
KTKL	26	1.8	67.1	451.2	105.3	0.	625.4	.1	2.6	17.4	4.1	0.	24.1
KTFK	26	8.4	73.2	525.0	84.1	0.	690.7	.3	2.8	20.2	3.2	0.	26.6
LNEV	103	6.2	358.0	1408.0	464.4	5.2	2241.6	.1	3.5	13.7	4.5	.0	21.8
LNNA	149	6.5	432.3	826.5	487.2	147.9	1900.5	.0	2.9	5.5	3.3	1.0	12.8
MAD	120	.6	355.6	1294.1	504.0	96.0	2250.3	.0	3.0	10.8	4.2	.8	18.8
MFCH	77	7.8	243.2	1029.3	299.0	83.4	1662.7	.1	3.2	13.4	3.9	1.1	21.6
MFVG	39	4.4	153.2	491.7	132.0	42.3	823.5	.1	3.9	12.6	3.4	1.1	21.1
MFW	63	4.9	189.4	597.1	250.6	9.5	1051.5	.1	3.0	9.5	4.0	.2	16.7
MRS	17	.1	53.4	158.5	51.6	26.9	290.4	.0	3.1	9.3	3.0	1.6	17.1
NWBE	20	3.3	82.1	155.4	73.0	.7	314.5	.2	4.1	7.8	3.7	.0	15.7
NWCH	19	2.2	76.9	212.5	61.1	13.3	366.1	.1	4.0	11.2	3.2	.7	19.3

2000 Three-Yard Bidirectional New Yard

Outbound Classification	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
NWDK	50	1.5	201.0	395.1	224.2	1.7	823.5	.0	4.0	7.9	4.5	.0	16.5
NWDT	27	2.0	111.1	243.7	108.0	18.9	483.7	.1	4.1	9.0	4.0	.7	17.9
NWW	116	17.7	413.4	871.7	450.6	125.7	1879.0	.2	3.6	7.5	3.9	1.1	16.2
RI	92	5.4	241.2	1260.8	318.7	41.4	1867.4	.1	2.6	13.7	3.5	.5	20.3
SFAV	65	8.6	189.6	594.8	183.1	141.9	1117.9	.1	2.9	9.2	2.8	2.2	17.2
SFCU	56	10.1	189.4	382.3	150.5	123.2	855.4	.2	3.4	6.8	2.7	2.2	15.3
SFIR	27	.6	85.9	211.8	77.8	46.8	423.0	.0	3.2	7.8	2.9	1.7	15.7
SFLD	38	10.4	114.0	392.8	95.0	95.0	707.3	.3	3.0	10.3	2.5	2.5	18.6
SFMS	116	6.6	382.1	688.2	332.4	205.1	1614.4	.1	3.3	5.9	2.9	1.8	13.9
SFPA	63	3.8	186.9	564.6	191.4	110.3	1057.0	.1	3.0	9.0	3.0	1.8	16.8
SFSP	84	11.8	253.7	1161.8	252.2	126.0	1805.5	.1	3.0	13.8	3.0	1.5	21.5
SFTU	96	10.5	314.2	961.5	338.1	86.4	1710.7	.1	3.3	10.0	3.5	.9	17.8
SOCG	54	17.4	186.3	283.5	160.2	75.6	723.0	.3	3.5	5.3	3.0	1.4	13.4
SOMA	70	20.5	236.4	908.3	250.7	39.7	1455.5	.3	3.4	13.0	3.6	.6	20.8
SOFR	55	18.6	183.6	513.0	181.8	42.2	939.1	.3	3.3	9.3	3.3	.8	17.1
SSW	66	5.1	196.9	844.5	189.8	134.2	1370.6	.1	3.0	12.8	2.9	2.0	20.8
TOTAL	3114	354.0	10399.9	31059.6	11292.8	2819.6	55925.8	.1	3.3	10.0	3.6	.9	18.0

2000 Three-Yard Bidirectional New Yard

Time of Day Interval	Number of Cars	Aggregate Car Hours						Average Car Hours/Car					
		Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time	Hold-Out Time	Yarding Time	Switching Time	Make-Up Time	Schedule Slack	Total Detention Time
INT-1	406	1.7	1038.0	3831.4	1459.1	407.7	6737.8	.0	2.6	9.4	3.6	1.0	16.6
INT-2	767	143.9	2551.7	6400.7	2755.1	751.1	12602.5	.2	3.3	8.3	3.6	1.0	16.4
INT-3	583	95.9	2088.3	4793.0	2235.8	451.7	9664.6	.2	3.6	8.2	3.8	.8	16.6
INT-4	517	44.0	1739.0	5726.9	1787.2	551.5	9848.6	.1	3.4	11.1	3.5	1.1	19.0
INT-5	381	11.8	1514.4	5029.6	1388.9	278.5	8223.2	.0	4.0	13.2	3.6	.7	21.6
INT-6	460	56.7	1468.6	5278.0	1666.7	379.1	8849.0	.1	3.2	11.5	3.6	.8	19.2
TOTAL	3114	354.0	10399.9	31059.6	11292.8	2819.6	55925.8	.1	3.3	10.0	3.6	.9	18.0

APPENDIX C

Corridor Operating Statistics

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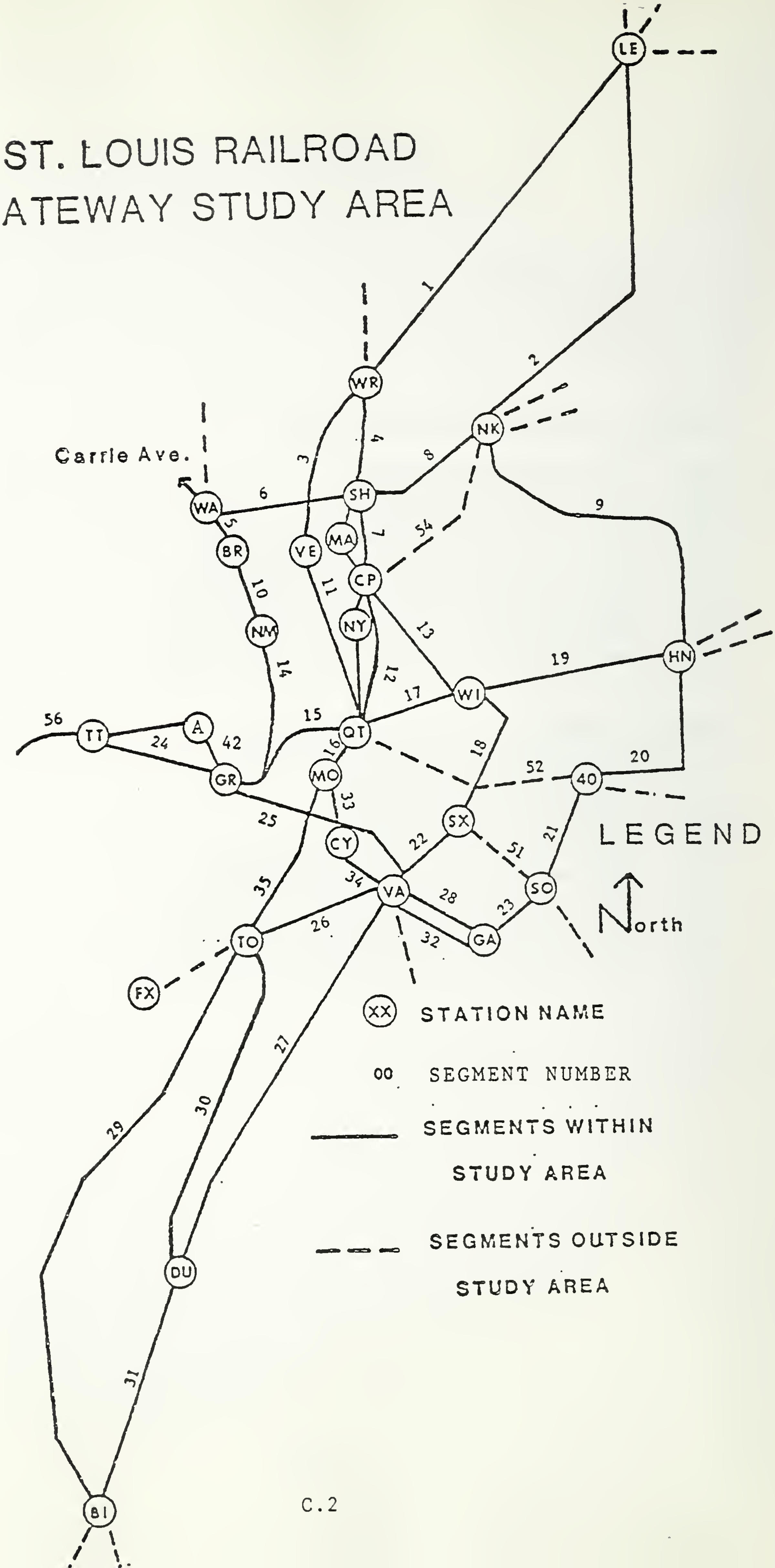
ST. LOUIS RAILROAD GATEWAY STUDY AREA



STATION KEY

Code	Station Name
LE	Lenox
NK	NKP Tower
HN	HN Cabin
40	40th St. L&N
SO	Southern Junction
GA	Gateway Yard
VA	Valley Junction
TO	Tolson
FX	Fox
WR	WR Tower
SH	SH Tower
CP	CP Junction
WI	Willows
SX	Southern Crossing
DU	Dupo
BI	Bixby
VE	Venice
QT	Q Tower
WA	West Approach
BR	Bremen
NM	North Market
GR	Gratiot
TT	Tower 2
CY	"C" Yard
NY	New Yard
ID	ID Tower
MO	MO Junction
MA	Madison
NG	North End Gateway Yard
A	Amtrak

Source: CONSAD Research Corporation.

LINK KEY

Link Number	Route	Owning or Operating Railroad	Number of Main Tracks	Mileage
1	Lenox - WR	CR/ICG/NW	4	6.1
2	Lenox - NKP Tower	A&S	1	6.2
3	WR - Venice	CR/ICG/NW	3	3.2
4	WR - SH	TRRA	2	1.7
5	West Approach - Bremen	TRRA	2	0.4
6	West Approach - SH	TRRA	2	1.6
7	SH - CP	TRRA	2	1.2
8	SH - NKP Tower	TRRA/CNW/NW	1	1.4
9	NKP Tower - HN Cabin	A&S	1/2	4.9
10	Bremen - North Market	TRRA	2	1.2
11	Venice - Q Tower	CR/ICG/TRRA	2	1.8
12	CP Jct. - Q Tower	TRRA/IT/CNW/NW	3.	2.4
13	CP Jct. - Willows	TRRA	2	2.2
14	North Market - Gratiot	TRRA	2	2.9
15	Q Tower - Gratiot	City of St. Louis	2	1.4
17	Q Tower - Willows	CR/BO	2/3	2.0
18	Willows - Southern Crossing	TRRA	2	2.6
19	Willows - HN Cabin	CR/BO	3	2.9
20	HN Cabin - 40th St. L&N	A&S	2	3.2
21	40th St. L&N - Southern	A&S	2	2.2
22	Southern Crossing - Valley Junction	TRRA	2	1.1
23	Soutern - Gateway	A&S	3	0.5
24	Gratiot - Tower Two	TRRA/MP	2	1.7
25	Gratiot - Valley	City of St. St. Louis	2	2.9
26	Valley - Tolson	A&S	1/2	2.4
27	Valley - Dupo	MP	3/2	7.3
28	Valley - Gateway	A&S	2	1.5
29	Tolson - Bixby	ICG	1	10.3
30	Tolson - Dupo	TRRA	2/1	6.3
31	Dupo - Bixby	MP	2	2.2
32	Gateway - Valley	A&S	3	0.2
33	M&O Jct. - C Yard	ICG	2	1.1
34	C Yard - Valley	ICG	2	1.8
35	Q Tower - Tolson	TRRA/ICG	2	4.8
42	Gratiot - Amtrak	TRRA	1	0.2

Road Key

Road ID	Carrier Name
AS	Alton & Southern
AT	Amtrak
BN	Burlington Northern
BO	Baltimore & Ohio
CR	Conrail
CW	Chicago & North Western
IC	Illinois Central Gulf
IT	Illinois Terminal
KT	Missouri-Kansas-Texas
LN	Louisville & Nashville
MP	Missouri Pacific
NW	Norfolk & Western
NY	New Yard Transfers
RI	Chicago, Rock Island & Pacific
SF	St. Louis-San Francisco
SO	Southern Railway
SW	St. Louis Southwestern
TO	TOFC Yard Transfers
TR	Terminal Railroad Association of St. Louis

Source: CONSAD Research Corporation

C.1 1979 No Build Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	47	2562	148572	44.5	16.3	.2	906289	971	286.7
2	11	851	46805	22.5	8.9	2.2	290190	860	68.2
3	17	887	48785	15.0	5.2	.1	156111	283	54.4
4	37	1886	107453	23.1	10.9	1.9	182670	534	62.9
5	35	1523	84048	8.2	4.1	0.	33619	192	14.0
6	66	2946	162313	34.3	16.8	.6	259700	778	105.6
7	17	718	42930	8.7	4.1	.2	51515	176	20.4
8	0	0	0	0.	0.	0.	0	0	0.
9	17	1191	68601	32.5	14.5	.4	336144	1044	83.3
10	37	1657	91418	15.6	8.0	0.	109701	391	44.4
11	13	748	41140	12.9	4.8	0.	74051	291	23.4
12	0	0	0	0.	0.	0.	0	0	0.
13	32	1529	86787	25.5	13.6	1.3	190931	615	70.4
14	32	1477	81518	20.9	10.2	0.	236402	513	92.8
15	1	87	4785	.6	.3	0.	6698	26	1.4
17	7	380	20900	3.5	1.4	0.	41800	81	14.0
18	24	1129	61347	13.2	6.6	0.	159502	336	62.4
19	19	999	58385	16.0	5.2	.7	169316	314	55.1
20	28	2099	118541	49.4	19.0	.7	379331	1436	89.6
21	30	2173	122611	42.7	17.0	.6	269744	1293	66.0
22	14	582	32010	6.6	3.3	.4	35210	147	15.4
23	34	2398	134986	44.9	17.1	2.1	67493	1271	17.0
24	49	2970	163716	26.3	11.9	0.	278317	722	83.3
25	23	1552	85298	29.0	11.4	2.6	247364	813	66.7
26	5	58	3190	1.3	1.3	0.	7655	15	12.0
27	46	3300	184534	61.9	22.4	1.4	1347098	1627	335.8
28	0	0	0	0.	0.	0.	0	0	0.
29	2	24	1320	1.2	1.2	0.	13595	14	20.6
30	2	80	4400	2.1	1.3	0.	27719	54	12.6
31	44	3547	194090	20.1	6.8	.3	426997	542	96.8
32	0	0	0	0.	0.	0.	0	0	0.
33	14	740	40700	9.1	3.1	.8	44769	194	15.4
34	15	916	47356	9.7	3.6	0.	85240	235	27.0
35	4	104	5720	5.3	4.2	0.	27455	110	19.2
42	6	29	1450	.2	.2	0.	289	1	1.2

C.2 1985 No Build Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	33	2036	119642	32.5	12.4	.2	729816	859	201.3
2	8	577	31735	7.6	3.4	.1	196756	248	49.6
3	12	971	53405	11.1	3.7	.1	198945	306	41.4
4	31	1527	88291	15.7	8.6	1.1	150094	414	52.7
5	34	1730	96637	13.0	6.5	1.5	38654	380	13.6
6	64	3315	183812	43.2	21.1	.9	294099	1183	102.4
7	18	948	55580	9.5	4.6	.5	66695	260	21.6
8	0	0	0	0.	0.	0.	0	0	0.
9	16	1153	67543	39.8	16.1	1.7	330960	1137	78.4
10	37	1926	107417	18.8	9.6	.6	128900	533	44.4
11	12	743	40865	12.4	4.8	.5	73556	331	21.6
12	1	61	3355	.3	.2	0.	8051	10	2.4
13	34	2086	117169	39.9	19.6	6.7	257771	1318	74.8
14	32	1776	99167	21.4	10.2	.0	287584	622	92.8
15	2	215	11825	1.1	.6	0.	16554	60	2.8
17	8	667	36685	5.4	1.9	0.	73370	175	16.0
18	22	1274	69069	13.2	6.9	.2	179579	424	57.2
19	21	1666	95070	15.8	4.9	.1	275702	415	60.9
20	30	2465	139703	63.2	23.8	.5	447049	1999	96.0
21	32	2549	144323	61.1	21.8	2.7	317510	2033	70.4
22	12	581	31955	6.0	3.3	.7	35150	161	13.2
23	34	2727	154113	45.5	17.2	1.4	77056	1469	17.0
24	60	4704	267998	35.3	15.0	.2	455596	1115	102.0
25	33	2770	159996	45.8	17.0	2.3	463988	1392	95.7
26	5	69	3795	2.2	2.2	.9	9107	39	12.0
27	55	4869	279569	****	43.3	8.4	2040853	3727	401.5
28	0	0	0	0.	0.	0.	0	0	0.
29	2	29	1595	1.4	1.4	.1	16428	20	20.6
30	2	89	4895	2.2	1.3	0.	30838	66	12.6
31	55	5197	296949	27.5	9.2	.8	653287	834	121.0
32	0	0	0	0.	0.	0.	0	0	0.
33	14	850	46750	6.4	3.0	.6	51424	173	15.4
34	15	1035	53901	10.2	4.1	.3	97021	304	27.0
35	4	118	6490	4.9	4.1	0.	31151	112	19.2
42	6	29	1450	.2	.2	0.	289	0	1.2

C.3 2000 No Build Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	43	2885	166337	43.9	16.6	.3	1014655	1244	262.3
2	10	884	48620	10.7	4.3	.1	301443	393	62.0
3	17	1245	68475	14.6	5.0	.1	219119	377	54.4
4	36	2151	128029	20.3	10.3	1.9	217649	628	61.2
5	35	2284	132550	14.8	7.0	1.3	53019	528	14.0
6	69	4573	258420	59.8	28.0	3.3	413471	2107	110.4
7	18	1174	68010	10.2	4.8	.7	81611	346	21.6
8	0	0	0	0.	0.	0.	0	0	0.
9	17	1450	88393	49.9	19.1	3.8	433125	1684	83.3
10	42	2658	153095	21.6	10.8	.6	183713	734	50.4
11	13	999	54945	14.0	5.2	.5	98900	423	23.4
12	1	101	5555	.3	.2	0.	13331	16	2.4
13	40	3193	176976	49.9	23.4	4.1	389347	1887	88.0
14	35	2379	137750	24.2	11.3	.0	399474	843	101.5
15	3	328	18040	2.3	.8	0.	25255	92	4.2
17	11	954	52470	7.9	2.6	0.	104940	250	22.0
18	28	2238	121011	18.4	8.8	.2	314628	736	72.8
19	28	2587	145725	22.3	7.0	.5	422602	706	81.2
20	34	3267	188328	78.0	27.2	2.1	602649	2681	108.8
21	36	3387	194928	72.5	24.7	2.7	428841	2599	79.2
22	13	918	50490	6.5	3.6	.7	55538	256	14.3
23	39	3551	203948	68.8	24.3	3.6	101974	2334	19.5
24	84	7395	436042	48.2	19.3	.2	741271	1657	142.8
25	53	4738	282857	73.8	25.3	1.7	820285	2301	153.7
26	5	104	5720	2.2	2.2	.9	13727	59	12.0
27	80	7615	449735	****	59.2	9.5	3283065	5649	584.0
28	0	0	0	0.	0.	0.	0	0	0.
29	2	42	2310	1.4	1.4	.1	23792	29	20.6
30	2	81	4455	2.2	1.3	0.	28066	62	12.6
31	82	7971	470771	41.0	13.3	.8	1035696	1289	180.4
32	0	0	0	0.	0.	0.	0	0	0.
33	15	1148	63140	7.2	3.2	.6	69453	229	16.5
34	16	1365	72051	11.4	4.4	.0	129691	399	28.8
35	4	123	6765	5.8	4.9	.8	32471	135	19.2
42	6	29	1450	.2	.2	0.	289	0	1.2

C.4 1985 Two-Yard Directional Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	42	2346	133252	14.7	6.4	0.	812837	356	256.2
2	9	531	32645	5.3	2.3	0.	202398	130	55.8
3	28	1840	107073	6.3	2.3	0.	342633	201	89.6
4	21	866	47630	5.8	2.7	0.	80970	115	35.7
5	24	1481	87328	2.1	1.0	0.	38803	66	10.4
6	53	3104	176593	11.6	5.4	.9	282548	303	84.8
7	10	229	12595	1.8	.9	0.	15113	23	12.0
8	0	0	0	0.	0.	0.	0	0	0.
9	19	1620	95667	8.8	3.6	.0	468768	325	93.1
10	22	1249	74568	2.4	1.2	0.	89481	69	26.4
11	28	1537	84535	4.9	2.3	.1	152162	130	50.4
12	0	0	0	0.	0.	0.	0	0	0.
13	8	164	9020	2.9	1.3	0.	19843	24	17.6
14	21	1279	76218	5.7	2.7	0.	221032	180	60.9
15	9	402	22110	2.3	1.2	0.	30953	57	12.6
17	25	1639	90145	7.9	3.0	.3	180290	219	50.0
18	13	212	11660	4.3	3.3	0.	30315	53	33.8
19	33	1872	102960	7.3	2.9	.1	298583	155	95.7
20	33	2670	149977	11.1	4.0	.3	479926	341	105.6
21	36	2864	160647	5.8	2.6	.1	353423	163	79.2
22	13	212	11660	2.4	1.9	0.	12825	30	14.3
23	40	3232	181888	12.8	4.3	.2	90944	361	20.0
24	60	4848	289383	16.0	5.8	.8	491951	470	102.0
25	38	3456	206805	19.8	6.7	.7	599734	590	110.2
26	3	48	2640	.7	.7	0.	6335	11	7.2
27	50	4151	249158	36.4	12.9	1.9	1818853	1115	365.0
28	0	0	0	0.	0.	0.	0	0	0.
29	9	768	42240	5.8	2.4	0.	435071	178	92.7
30	7	559	30745	3.5	1.4	0.	193693	113	44.1
31	47	4628	277313	13.8	4.8	.1	618888	473	104.4
32	0	0	0	0.	0.	0.	0	0	0.
33	41	2191	120505	6.7	3.5	.6	132555	199	45.1
34	42	2339	125621	8.5	4.2	.1	226117	244	75.6
35	18	1351	74305	3.3	2.5	0.	356663	98	86.4
42	6	29	1450	.2	.2	0.	289	1	1.2

C.5 2000 Two-Yard Directional Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	45	2903	163887	16.8	7.0	0.	999710	457	274.5
2	9	684	44500	4.7	2.1	0.	275899	138	55.8
3	34	2479	143250	8.7	3.0	.1	458399	257	108.8
4	20	1001	55055	5.7	2.9	.3	93593	147	34.0
5	26	1735	102330	2.1	.9	0.	40931	64	10.4
6	58	4096	232185	12.3	5.4	.5	371495	388	92.8
7	9	247	13585	1.5	.8	0.	16301	22	10.8
8	0	0	0	0.	0.	0.	0	0	0.
9	29	2406	150877	13.5	5.4	.0	739297	466	142.1
10	27	1759	103650	3.7	1.6	0.	124379	106	32.4
11	31	2059	113245	6.5	2.8	.1	203840	197	55.8
12	0	0	0	0.	0.	0.	0	0	0.
13	7	188	10340	2.5	1.1	0.	22747	28	15.4
14	25	1677	99140	7.7	3.2	0.	287505	227	72.5
15	9	522	28710	2.3	1.2	0.	40193	79	12.6
17	27	2253	123915	8.1	3.1	.4	247830	264	54.0
18	13	446	24530	4.0	3.1	0.	63777	105	33.8
19	33	2578	141790	7.3	2.9	.1	411190	212	95.7
20	43	3800	220667	15.2	5.2	.1	706134	465	137.6
21	46	4074	235737	7.2	3.6	0.	518621	220	101.2
22	13	446	24530	2.4	1.8	0.	26982	62	14.3
23	47	4413	251358	19.3	6.2	1.0	125679	602	23.5
24	86	7381	436129	24.4	8.4	.2	741419	759	146.2
25	59	5377	318859	35.7	11.8	2.0	924690	1046	171.1
26	3	83	4565	.7	.7	0.	10955	20	7.2
27	72	6209	373262	52.5	17.6	1.9	2724812	1567	525.6
28	0	0	0	0.	0.	0.	0	0	0.
29	11	1025	56375	7.3	2.9	0.	580662	247	113.3
30	8	689	37895	4.3	1.6	0.	238738	140	50.4
31	72	6632	397983	21.2	7.1	.0	875562	653	158.4
32	0	0	0	0.	0.	0.	0	0	0.
33	43	2832	155760	7.6	4.0	1.0	171335	253	47.3
34	44	2921	157631	9.4	4.6	.2	283735	312	79.2
35	21	1753	96415	3.7	3.1	0.	462791	118	100.8
42	6	29	1450	.2	.2	0.	289	1	1.2

C.6 1985 Three-Yard Directional Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	39	2318	131712	17.0	7.0	0.	803443	433	237.9
2	9	528	32480	4.7	2.0	0.	201375	117	55.8
3	26	1703	95152	7.2	2.9	0.	304486	201	83.2
4	19	872	47960	7.1	3.6	1.0	81531	136	32.3
5	13	402	23597	1.1	.6	0.	9438	20	5.2
6	41	2110	117537	7.2	3.3	.2	188059	169	65.6
7	8	164	9020	2.2	.9	.1	10823	18	9.6
8	0	0	0	0.	0.	0.	0	0	0.
9	21	1683	99132	7.8	3.4	0.	485746	268	102.9
10	13	394	23157	1.2	.7	0.	27788	25	15.6
11	26	1520	83600	7.6	3.3	.4	150479	202	46.8
12	0	0	0	0.	0.	0.	0	0	0.
13	8	164	9020	2.1	.9	0.	19843	17	17.6
14	11	365	21562	2.2	1.2	0.	62529	52	31.9
15	24	1353	74415	8.2	3.7	1.2	104180	228	33.6
17	29	1826	100430	15.2	6.0	1.9	200860	401	58.0
18	13	212	11660	3.6	2.8	0.	30315	45	33.8
19	33	2010	110550	4.6	2.9	.1	320594	112	95.7
20	33	2782	156137	10.1	3.4	.2	499638	294	105.6
21	35	2775	155752	5.8	2.5	.1	342654	168	77.0
22	13	212	11660	2.1	1.6	0.	12825	26	14.3
23	38	3143	176993	15.9	5.2	.7	88496	449	19.0
24	63	4907	288242	14.4	5.3	.1	490011	420	107.1
25	38	3344	200645	20.9	7.2	.7	581870	639	110.2
26	8	108	5940	2.0	2.0	.3	14255	30	19.2
27	46	3765	227928	27.3	10.0	.8	1663874	836	335.8
28	0	0	0	0.	0.	0.	0	0	0.
29	16	1476	81180	10.3	4.3	0.	836153	334	164.8
30	3	327	17985	2.5	.8	0.	113305	88	18.9
31	39	3752	229133	11.9	4.0	0.	504092	388	85.8
32	0	0	0	0.	0.	0.	0	0	0.
33	50	2658	146190	10.8	5.3	.7	160808	293	55.0
34	51	2754	148446	14.1	6.6	1.0	267202	396	91.8
35	22	1867	102685	7.4	3.1	.2	492887	232	105.6
42	6	29	1450	.3	.3	0.	289	1	1.2

C.7 2000 Three-Yard Directional Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	43	2936	165702	20.0	8.1	0.	1010782	567	262.3
2	9	604	36660	4.7	2.0	0.	227291	135	55.8
3	31	2295	133130	8.8	3.4	0.	426015	270	99.2
4	20	1112	61160	7.0	3.2	.5	103971	170	34.0
5	15	606	40235	1.4	.7	0.	16093	32	6.0
6	46	3047	174490	9.0	3.9	.5	279183	270	73.6
7	8	240	13200	2.2	.9	0.	15839	26	9.6
8	0	0	0	0.	0.	0.	0	0	0.
9	29	2389	146502	15.5	6.0	0.	717859	452	142.1
10	16	663	43370	1.8	.9	0.	52043	45	19.2
11	27	1984	109120	7.8	3.4	.6	196415	243	48.6
12	0	0	0	0.	0.	0.	0	0	0.
13	8	240	13200	2.1	.9	0.	29039	23	17.6
14	13	561	37760	3.2	1.5	0.	109503	81	37.7
15	27	1856	102080	9.4	4.0	.8	142911	283	37.8
17	31	2532	139260	30.4	10.8	6.2	278520	970	62.0
18	13	446	24530	3.6	2.8	0.	63777	96	33.8
19	35	2760	151800	4.8	3.1	.1	440219	145	101.5
20	43	3955	229192	13.6	4.5	.2	733414	409	137.6
21	44	4008	232107	7.7	3.4	0.	510635	228	96.8
22	13	446	24530	2.1	1.6	0.	26982	54	14.3
23	44	4254	242613	21.0	6.9	1.5	121306	724	22.0
24	89	7483	441739	23.3	8.0	.5	750956	720	151.3
25	59	5281	313579	46.2	15.0	4.6	909378	1341	171.1
26	8	165	9075	2.0	2.0	.3	21779	46	19.2
27	70	6034	358723	45.4	15.6	1.6	2618677	1354	511.0
28	0	0	0	0.	0.	0.	0	0	0.
29	21	1973	108515	12.6	5.6	0.	1117704	436	216.3
30	3	374	20570	2.5	.8	0.	129590	105	18.9
31	61	5558	338913	19.5	6.3	0.	745608	575	134.2
32	0	0	0	0.	0.	0.	0	0	0.
33	52	3458	190190	11.0	5.3	1.1	209208	363	57.2
34	52	3547	192061	16.8	7.7	1.9	345709	591	93.6
35	27	2418	132990	9.5	4.0	.2	638351	322	129.6
42	6	29	1450	.3	.3	0.	289	1	1.2

C.8 1985 Three-Yard Bidirectional Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	42	2422	137432	13.5	5.1	0.	838335	321	256.2
2	9	635	38365	6.4	2.8	0.	237862	192	55.8
3	31	2050	114237	8.2	3.2	0.	365558	217	99.2
4	17	627	34485	3.9	1.8	0.	58624	63	28.9
5	24	1218	68477	3.4	1.7	0.	27390	91	9.6
6	53	2981	165442	17.7	7.0	.6	264707	437	84.8
7	8	163	8965	3.5	1.5	0.	10757	30	9.6
8	2	174	9570	.3	.1	0.	13397	8	2.8
9	21	1517	92459	5.4	2.5	0.	453049	175	102.9
10	29	1417	79422	4.7	2.4	0.	95306	122	34.8
11	21	1458	80190	4.5	1.7	0.	144341	119	37.8
12	0	0	0	0.	0.	0.	0	0	0.
13	8	163	8965	2.5	1.0	0.	19722	21	17.6
14	25	1356	76067	6.0	2.8	0.	220594	163	72.5
15	17	1013	55715	7.6	2.8	.7	78000	162	23.8
17	24	1654	95098	10.0	3.1	.8	190196	249	48.0
18	9	125	6875	2.4	1.9	0.	17874	26	23.4
19	31	1913	109343	8.6	3.3	0.	317094	205	89.9
20	36	2734	151826	10.5	3.8	.3	485843	289	115.2
21	32	2436	135436	6.1	2.3	0.	297959	178	70.4
22	9	125	6875	1.3	1.1	0.	7562	14	9.9
23	36	2895	159225	12.2	4.3	.3	79612	357	18.0
24	71	5497	314924	21.9	7.7	.5	535370	667	120.7
25	32	2789	164352	15.7	5.6	.6	476620	509	92.8
26	0	0	0	0.	0.	0.	0	0	0.
27	51	4353	250372	31.1	11.4	1.5	1827715	978	372.3
28	0	0	0	0.	0.	0.	0	0	0.
29	6	565	35203	4.7	1.6	0.	362590	146	61.8
30	0	0	0	0.	0.	0.	0	0	0.
31	54	4664	269397	13.4	4.7	.3	592673	426	118.8
32	0	0	0	0.	0.	0.	0	0	0.
33	30	1651	90805	7.0	3.4	.3	99885	184	33.0
34	30	1747	93061	8.5	4.0	0.	167509	233	54.0
35	6	565	35203	1.5	.8	0.	168974	46	28.8
42	6	29	1450	.3	.3	0.	289	1	1.2

C.9 2000 Three-Yard Bidrectional Alternative

Link Number	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
1	45	3255	183247	14.2	5.3	0.	1117806	401	274.5
2	10	818	48430	7.4	3.1	0.	300265	249	62.0
3	37	2905	166680	10.0	3.8	0.	533375	304	118.4
4	17	806	44330	4.1	1.9	0.	75360	87	28.9
5	30	1857	109040	3.8	1.8	0.	43615	108	12.0
6	60	4309	243900	22.6	8.2	1.4	390239	684	96.0
7	8	238	13090	3.1	1.4	0.	15707	36	9.6
8	2	246	13530	.3	.1	0.	18941	12	2.8
9	30	2437	149142	8.6	3.7	0.	730795	288	147.0
10	34	2118	123395	6.4	2.9	0.	148073	189	40.8
11	23	2040	112200	5.2	1.9	0.	201959	169	41.4
12	0	0	0	0.	0.	0.	0	0	0.
13	8	238	13090	2.5	1.0	0.	28797	31	17.6
14	30	1988	116245	7.8	3.3	0.	337110	234	87.0
15	18	1478	81290	10.1	3.6	1.3	113805	288	25.2
17	28	2542	148453	14.6	4.3	1.6	296906	465	56.0
18	9	242	13310	2.4	1.9	0.	34605	51	23.4
19	36	2998	173533	10.4	3.8	0.	503245	313	104.4
20	44	3971	221429	13.1	4.7	.2	708572	412	140.8
21	40	3560	198824	8.3	3.1	0.	437412	273	88.0
22	9	242	13310	1.3	1.1	0.	14640	28	9.9
23	40	3713	204215	19.7	6.7	2.2	102107	649	20.0
24	97	8421	490629	32.7	11.0	.2	834069	1019	164.9
25	52	4541	270179	33.4	10.8	2.2	783518	1033	150.8
26	0	0	0	0.	0.	0.	0	0	0.
27	75	6668	387164	45.9	16.7	2.0	2826296	1465	547.5
28	0	0	0	0.	0.	0.	0	0	0.
29	9	999	63588	7.6	2.4	0.	654956	261	92.7
30	0	0	0	0.	0.	0.	0	0	0.
31	78	7051	407228	20.2	6.9	.5	895901	636	171.6
32	0	0	0	0.	0.	0.	0	0	0.
33	32	2175	119625	8.7	4.1	.8	131587	278	35.2
34	32	2264	121496	9.5	4.3	.0	218692	300	57.6
35	9	999	63588	2.6	1.3	0.	305222	89	43.2
42	6	29	1450	.3	.3	0.	289	1	1.2

C.10 1979 No Build Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	27	1250	68750	57.8	35.5	2.4	480006	1672	176.1
AT	6	29	1450	6.2	6.2	0.	20444	31	84.6
BN	5	381	28762	22.9	9.1	.9	335287	776	60.3
BO	9	562	30910	28.9	8.2	.6	166253	637	47.1
CR	30	2059	113245	118.5	34.2	3.5	1019111	2924	238.4
CW	5	297	22355	24.8	7.7	.2	239758	589	44.4
IC	28	1210	63526	67.0	26.2	1.1	628327	1309	248.9
IT	5	171	6651	6.5	4.3	.5	39671	166	24.7
KT	0	0	0	0.	0.	0.	0	0	0.
LN	1	58	3190	2.5	.8	0.	8612	47	2.7
MP	42	3169	169153	76.9	30.4	2.1	1353077	2246	327.5
MS	2	83	4565	2.7	1.3	.3	20998	52	9.2
NW	13	988	54340	58.5	24.1	1.4	783986	2226	171.4
NY	0	0	0	0.	0.	0.	0	0	0.
RI	0	0	0	0.	0.	0.	0	0	0.
SF	3	154	8470	9.8	3.8	0.	66065	204	23.4
SO	2	143	4193	2.7	1.2	0.	20126	103	9.6
SW	17	1047	57585	28.8	10.0	.4	547057	610	161.5
TO	0	0	0	0.	0.	0.	0	0	0.
TR	70	2827	155485	92.3	51.9	3.1	734145	2292	308.2
GRAND TOTALS	265	14428	792630	607.0	255.1	16.4	6462930	15893	1938.0

C.11 1985 No Build Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	28	1402	77110	60.2	35.8	3.6	469314	1809	167.7
AT	6	29	1450	4.4	4.4	0.	20444	21	84.6
BN	5	396	29587	29.0	11.2	1.4	350406	950	62.0
BO	8	623	34265	35.7	9.7	1.0	184013	892	42.2
CR	27	2210	121550	103.9	32.7	1.4	943579	3184	189.1
CW	5	372	28501	33.9	9.8	1.6	327838	948	45.6
IC	23	1268	66716	57.9	24.0	1.8	676507	1473	198.7
IT	5	179	7091	9.5	6.3	1.8	42482	259	25.9
KT	0	0	0	0.	0.	0.	0	0	0.
LN	1	65	3575	2.6	.9	0.	9652	56	2.7
MP	53	4415	250957	134.7	48.9	2.7	2399965	4302	461.2
MS	2	94	5170	2.0	1.0	.1	23781	51	9.2
NW	13	1147	63085	71.0	27.0	2.2	920023	2688	171.4
NY	0	0	0	0.	0.	0.	0	0	0.
RI	0	0	0	0.	0.	0.	0	0	0.
SF	3	189	10395	11.7	4.1	0.	65042	220	20.7
SO	2	191	5591	7.5	2.8	1.3	26836	431	9.6
SW	17	1357	74635	61.9	21.4	7.7	709032	1645	161.5
TO	0	0	0	0.	0.	0.	0	0	0.
TR	70	3330	183150	109.2	61.7	6.3	864929	3198	306.6
GRAND TOTALS	268	17267	962828	735.1	301.8	33.1	8033851	22134	1958.7

C.12 2000 No Build Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	28	1825	100375	64.1	37.8	4.6	617523	2587	170.4
AT	6	29	1450	4.9	4.9	0.	20344	23	84.2
BN	5	371	28212	29.0	11.2	.6	327031	851	62.0
BO	11	944	51920	51.6	13.8	1.3	348100	1498	67.4
CR	32	3246	178530	125.6	37.8	2.5	1283298	4304	216.8
CW	9	860	64070	62.6	18.0	2.7	659219	1836	81.3
IC	30	1944	103896	76.0	30.9	2.3	1042741	2162	274.7
IT	5	208	8686	8.9	5.6	1.2	47520	267	25.9
KT	0	0	0	0.	0.	0.	0	0	0.
LN	1	90	4950	2.6	.9	0.	13364	77	2.7
MP	78	6740	399313	236.1	81.1	4.5	4247110	7380	768.8
MS	2	74	4070	2.0	1.0	.1	18721	36	9.2
NW	16	1532	84260	99.6	35.8	3.8	1259301	3928	214.5
NY	0	0	0	0.	0.	0.	0	0	0.
RI	0	0	0	0.	0.	0.	0	0	0.
SF	4	372	20460	14.8	4.9	0.	125432	419	25.8
SO	4	381	10749	12.0	4.3	1.5	51595	486	19.2
SW	18	1654	90970	69.4	22.5	8.1	864214	2126	171.0
TO	0	0	0	0.	0.	0.	0	0	0.
TR	73	4535	249425	123.5	69.3	8.2	1127587	4701	314.8
GRAND TOTALS	322	24805	1401336	982.8	379.9	41.1	12053105	32689	2508.7

C.13 1985 Two-Yard Directional Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	22	951	52305	12.0	7.2	.5	302136	307	138.1
AT	6	29	1450	2.7	2.7	0.	22619	12	93.6
BN	5	396	29587	6.0	2.2	.0	325792	194	57.3
BO	11	661	36355	7.7	2.3	.4	194034	183	49.9
CR	31	2300	126500	26.3	8.7	.3	1078962	742	232.0
CW	8	811	52646	11.3	4.2	.3	650017	480	87.5
IC	40	1632	86736	29.6	14.2	.4	843866	588	358.7
IT	3	167	6431	1.7	.7	0.	35705	60	13.4
KT	4	216	11880	3.6	1.5	0.	70064	65	30.3
LN	3	194	10670	1.3	.5	0.	28808	32	8.1
MP	55	4911	294282	62.5	22.1	1.9	2865317	2054	481.0
MS	3	71	3905	1.3	.7	.1	14409	17	10.4
NW	17	1268	69740	14.8	5.9	0.	868614	486	175.5
NY	0	0	0	0.	0.	0.	0	0	0.
RI	2	167	9185	.9	.2	0.	14695	14	3.2
SF	17	1367	75185	16.8	5.9	.3	471866	485	107.0
SO	7	823	40351	4.0	1.1	0.	70116	146	13.3
SW	16	1386	76230	17.2	5.8	1.0	812272	506	168.8
TO	14	228	12540	7.5	5.3	0.	85799	87	88.4
TR	39	1818	99990	13.5	7.1	1.0	328910	341	121.5
GRAND TOTALS	303	19396	1095968	240.8	98.4	6.2	9084009	6809	2238.0

C.14 2000 Two-Yard Directional Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	22	1300	71500	13.3	7.8	1.1	414831	450	138.1
AT	6	29	1450	2.7	2.7	0.	22619	12	93.6
BN	5	451	36052	5.4	2.1	.1	389441	187	57.3
BO	12	992	54560	10.9	3.0	.4	394608	300	72.9
CR	32	3118	171490	28.6	9.3	.3	1456531	956	255.0
CW	13	1252	85630	19.1	6.9	.1	1095523	698	154.4
IC	42	2141	114731	31.4	14.7	.7	1100887	776	366.2
IT	3	161	6101	1.7	.7	0.	35309	59	13.4
KT	4	280	15400	3.6	1.5	.0	90661	85	30.3
LN	3	274	15070	1.3	.5	0.	40688	45	8.1
MP	80	6634	396797	105.6	35.9	1.9	4208576	3116	790.6
MS	3	109	5995	1.1	.6	0.	21966	22	10.4
NW	20	1630	89650	19.5	7.4	.3	1124942	657	219.5
NY	0	0	0	0.	0.	0.	0	0	0.
RI	1	149	8195	.6	.1	0.	13111	14	1.6
SF	21	2028	111540	25.8	8.5	1.3	699467	785	135.0
SO	12	1127	56882	10.4	2.9	.3	132987	280	45.7
SW	17	1678	92290	18.1	6.0	.8	968230	609	178.3
TO	14	451	24805	7.7	5.6	0.	192356	191	93.3
TR	37	2243	123365	11.7	6.3	.6	386765	384	115.0
GRAND TOTALS	347	26047	1481503	318.7	122.5	7.8	12789503	9636	2778.7

C.15 1985 Three-Yard Directional Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	30	1329	73095	15.7	9.4	1.1	361459	434	152.2
AT	6	29	1450	2.8	2.8	0.	22619	13	93.6
BN	6	407	30192	5.3	2.2	0.	328938	164	62.5
BO	10	670	36850	8.0	2.6	.5	196349	188	49.0
CR	30	2300	126500	31.6	10.8	2.2	1081602	902	230.1
CW	9	811	52646	9.6	3.5	.0	652173	369	94.6
IC	37	1566	83106	35.1	15.5	1.5	794047	745	305.4
IT	1	102	2856	1.7	.5	0.	31415	56	11.0
KT	4	216	11880	6.0	2.5	.3	70064	121	30.3
LN	3	201	11055	2.7	.7	0.	60736	51	13.5
MP	49	4328	257831	60.2	21.9	1.1	3112404	1996	548.9
MS	3	90	4950	1.3	.7	0.	22769	19	13.8
NW	17	1289	70895	17.5	6.8	.1	889679	584	181.7
NY	17	760	41800	6.0	3.6	.7	98493	134	43.6
RI	2	167	9185	.8	.2	0.	14695	12	3.2
SF	17	1367	75185	13.6	4.5	.8	286780	383	64.7
SO	7	823	40351	5.6	1.5	.2	70116	197	13.3
SW	15	1218	66990	15.3	5.0	.3	724492	400	159.3
TO	14	219	12045	6.5	4.6	0.	87867	75	93.3
TR	25	1025	56375	9.3	5.2	.7	163157	198	72.8
GRAND TOTALS	302	18917	1065237	254.8	104.3	9.5	9069863	7052	2236.8

C.16 2000 Three-Yard Directional Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	30	1723	94765	15.7	9.4	1.4	476475	572	152.2
AT	6	29	1450	2.6	2.6	0.	22619	12	93.6
BN	6	385	28982	8.9	3.4	0.	306421	211	62.5
BO	12	992	54560	15.6	4.9	2.1	395928	411	74.9
CR	32	3118	171490	42.1	14.3	4.3	1463406	1440	256.0
CW	13	1252	85630	18.6	6.6	.9	1095523	695	154.4
IC	38	2138	114566	38.8	16.8	1.8	1084442	1028	320.5
IT	1	102	2856	1.7	.5	0.	31415	56	11.0
KT	4	280	15400	6.0	2.5	.3	90661	153	30.3
LN	3	327	17985	6.0	1.3	.7	89248	167	13.5
MP	74	6262	376337	111.4	38.5	3.8	4822931	3348	912.8
MS	3	117	6435	1.3	.7	0.	29600	26	13.8
NW	20	1651	90805	21.3	8.2	.4	1049531	733	211.3
NY	17	967	53185	6.8	3.9	1.0	123804	208	43.6
RI	2	253	13915	.8	.2	0.	22263	19	3.2
SF	21	2028	111540	23.8	7.6	2.6	425716	741	78.6
SO	12	1127	56882	9.5	2.8	.0	130429	242	45.2
SW	16	1552	85360	18.0	5.8	.8	902395	565	168.8
TO	14	451	24805	6.5	4.5	0.	192356	165	93.3
TR	27	1475	81125	9.8	5.2	.6	233892	293	75.6
GRAND TOTALS	351	26229	1488073	365.2	139.9	20.7	12989061	11093	2815.1

C.17 1985 Three-Yard Bidirectional Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	13	580	31900	8.3	4.5	.3	171440	212	76.4
AT	6	29	1450	3.1	3.1	0.	22619	15	93.6
BN	7	485	34482	6.4	2.5	0.	358033	201	70.9
BO	10	670	36850	7.6	2.5	.3	198934	179	51.0
CR	30	2236	122980	30.3	10.2	.9	992238	795	236.1
CW	9	811	52646	7.6	2.7	.2	588717	280	78.2
IC	28	1313	69191	28.5	12.0	.6	723862	576	262.3
IT	5	198	8136	4.0	2.2	0.	78281	104	45.4
KT	4	216	11880	3.4	1.4	0.	50159	55	25.6
LN	4	298	16390	4.7	1.3	0.	132758	101	32.4
MP	55	4697	272358	61.2	22.6	1.9	2792419	2007	521.5
MS	4	163	8965	1.4	.8	0.	40166	32	16.9
NW	15	1280	70400	16.2	6.1	.2	922861	572	172.1
NY	10	497	27335	2.7	1.7	0.	64179	90	24.6
RI	2	167	9185	3.5	.6	.4	14695	56	3.2
SF	19	1424	78320	22.8	8.0	.3	465662	599	112.0
SO	7	732	37803	3.7	1.0	0.	43871	99	13.3
SW	16	1166	64130	15.5	5.2	.7	580728	410	144.7
TO	7	98	5390	2.9	2.0	0.	27928	28	36.9
TR	23	964	53020	8.6	5.1	.1	185861	223	77.4
GRAND TOTALS	274	18024	1012811	242.5	95.6	5.8	8455420	6643	2094.5

C.18 2000 Three-Yard Bidirectional Alternative

Road ID	Number of Trains	Number of Cars	Gross Tons	Locomotive Unit Hours	Total Travel Time (hours)	Total Delay Time (hours)	Gross Ton Miles	Car Hours	Train Miles
AS	13	782	43010	8.3	4.5	.2	231753	267	76.4
AT	6	29	1450	3.0	3.0	0.	22619	14	93.6
BN	7	553	38222	6.4	2.5	0.	408435	228	70.9
BO	12	992	54560	12.6	3.9	.8	393728	351	75.9
CR	32	3182	175010	37.5	12.3	2.4	1418064	1243	261.0
CW	13	1252	85630	13.7	4.8	.1	1045092	459	142.8
IC	29	1882	100486	32.7	13.4	1.0	1054318	872	284.2
IT	5	242	10556	3.6	2.0	0.	100886	106	45.4
KT	4	280	15400	3.7	1.5	.1	66879	84	25.6
LN	4	411	22605	4.7	1.3	0.	183100	137	32.4
MP	80	7021	412925	111.9	38.8	4.3	4519064	3466	854.0
MS	4	156	8580	1.8	1.0	.1	37570	41	16.9
NW	18	1718	94490	20.4	7.5	.4	1224844	755	210.9
NY	10	540	29700	2.7	1.7	0.	65471	88	24.6
RI	2	253	13915	5.8	1.0	.8	22263	143	3.2
SF	23	2190	120450	30.5	10.2	.7	726786	938	144.7
SO	12	1220	61997	10.0	2.7	.6	183114	301	45.2
SW	17	1654	90970	16.0	5.5	.7	820049	533	154.2
TO	7	168	9240	2.7	1.9	0.	52040	48	36.9
TR	22	1187	65285	8.4	5.0	.2	227798	281	71.6
GRAND TOTALS	320	25712	1454481	336.5	124.7	12.3	12803878	10366	2670.4

APPENDIX D

Yard Hold-Outs

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NOTE: Key to Train Interference Symbols:

C - Class Track Pullout Lead Interference
D - Receiving Yard Doubling Interference
H - Hump Lead Interference
P - Pull to Hump Lead Interference
R - Receiving Yard Lead Interference

D.1 1979 No Build Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
DG07	VJCT	50012	None	-	0	33	0
PG01	MBRG	50253	None	-	0	23	0
LG92	ASML	50330	None	-	0	149	0
VG21	BKDR	50400	None	-	0	67	0
4G02	ASML	50655	None	-	0	90	0
4G04	ASML	50803	None	-	0	93	0
XG01	VJCT	50806	None	-	0	97	0
MV12	VJCT	51012	None	-	0	20	0
7G02	ASML	51020	XG01 (R,H)	51040	20	19	380
SG01	ASML	51030	7G02 (R)	51100	30	27	810
2G01	MBRG	51044	SG01 (R)	51120	36	43	1,548
DG05	VJCT	51047	None	-	0	90	0
XG03	VJCT	51121	None	-	0	73	0
VV10	BKDR	51130	2G01 (R)	51201	12	14	168
OG02	ASML	51425	None	-	0	42	0
XG05	VJCT	51437	None	-	0	81	0
LG16	ASML	51450	None	-	0	24	0
GG05	VJCT	51540	None	-	0	20	0
XG07	VJCT	51609	None	-	0	49	0
DG03	VJCT	51616	None	-	0	69	0
9G03	ASML	51625	None	-	0	20	0
XG11	VJCT	51647	None	-	0	59	0
LG02	ASML	51654	None	-	0	99	0
DG09	VJCT	51822	None	-	0	70	0
XG13	VJCT	51849	None	-	0	44	0
XG09	VJCT	51855	XG13 (R)	51910	15	36	540
5G02	ASML	52004	DG09 (R,H)	52022	18	131	2,358
2G03	MBRG	52136	None	-	0	83	0
LG04	ASML	52317	None	-	0	128	0
					131	1,793	5,804

D.2 1985 No Build Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
LG04	ASML	42317	None	-	0	141	0
DG07	VJCT	50012	None	-	0	34	0
PG01	MBRG	50253	None	-	0	27	0
LG92	ASML	50330	None	-	0	170	0
VG21	BKDR	50330	LG92 (R); PG01 (R)	50407	37	78	2,886
4G02	ASML	50655	None	-	0	99	0
4G04	ASML	50803	None	-	0	107	0
XG01	VJCT	50806	None	-	0	113	0
MV12	VJCT	51012	None	-	0	24	0
7G02	ASML	51020	None	-	0	20	0
SG01	ASML	51030	7G02 (R); 4G04 (R); XG01 (R)	51050	20	32	640
2G01	MBRG	51044	SG01 (R); DG04 (R); XG03 (R)	51213	89	46	4,094
DG05	VJCT	51047	None	-	0	79	0
XG03	VJCT	51121	None	-	0	85	0
VV10	BKDR	51130	XG03 (R); 2G01 (R)	51235	65	15	975
5G12	ASML	51420	None	-	0	55	0
XG05	VJCT	51437	None	-	0	93	0
LG16	ASML	51450	DG05 (R)	51501	11	29	319
GG05	VJCT	51540	None	-	0	24	0
XG07	VJCT	51609	None	-	0	57	0
DG03	VJCT	51616	XG07 (R)	51631	15	60	900
9G03	ASML	51625	None	-	0	24	0
XG11	VJCT	51647	None	-	0	71	0
LG02	ASML	51654	None	-	0	106	0
DG09	VJCT	51822	None	-	0	63	0
XG13	VJCT	51849	None	-	0	50	0
XG09	VJCT	51855	None	-	0	45	0
5G02	ASML	52004	None	-	0	158	0
2G03	MBRG	52136	None	-	0	90	0
					237	1,995	9,814

D.3 2000 No Build Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Gars	Gar-Min.
XG72	VJCT	50010	None	-	0	81	0
DG07	VJCT	50012	None	-	0	47	0
PG01	MBRG	50253	None	-	0	41	0
LG92	ASML	50330	None	-	0	108	0
VG21	BKDR	50330	LG92 (R); PG01 (R)	50428	58	111	6,438
4G02	ASML	50655	None	-	0	66	0
4G04	ASML	50803	None	-	0	112	0
XG01	VJGT	50806	None	-	0	90	0
MV12	VJCT	51012	None	-	0	41	0
7G02	ASML	51020	None	-	0	26	0
SG01	ASML	51030	7G02 (R); 4G04 (R)	51045	15	21	315
2G01	MBRG	51044	SG01 (R)	51105	21	84	1,764
DG05	VJGT	51047	None	-	0	55	0
XG03	VJCT	51121	None	-	0	130	0
VV10	BKDR	51130	XG03 (R)	51333	123	24	2,952
5G12	ASML	51420	None	-	0	81	0
XG05	VJGT	51437	None	-	0	151	0
LG16	ASML	51450	XG05 (R)	51630	100	45	4,500
GG05	VJGT	51540	None	-	0	37	0
XG07	VJGT	51609	None	-	0	90	0
DG03	VJGT	51616	XG07 (R)	51635	19	44	836
9G03	ASML	51625	LG16 (R); XG07 (R)	51717	52	37	1,924
XG11	VJGT	51647	None	-	0	110	0
LG02	ASML	51654	9G03 (R)	51739	45	152	6,840
DG09	VJGT	51822	None	-	0	43	0
XG13	VJGT	51849	None	-	0	84	0
XG09	VJGT	51855	XG13 (R)	51914	19	68	1,292
5G02	ASML	52004	None	-	0	138	0
2G03	MBRG	52136	None	-	0	94	0
LG04	ASML	52317	LG02 (R)	52320	3	102	306
					455	2,313	27,167

D.4 1985 Two-Yard Directional Gateway Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
WG05	VJCT	42345	None	--	0	45	0
CG03	VJCT	42359	WG05 (R)	50000	1	46	46
6215	MBRG	50028	None	--	0	102	0
MG06	VJCT	50110	None	--	0	53	0
-S06	ASML	50113	MG06 (R)	50125	12	47	564
-502	ASML	50225	None	--	0	147	0
-S02	ASML	50412	None	--	0	120	0
XG01	VJCT	50439	None	--	0	113	0
6219	MBRG	50528	None	--	0	74	0
VG01	VJCT	50530	None	-	0	73	0
XG21	VJCT	50710	None	--	0	19	0
-S04	ASML	50714	XG21 (R)	50725	11	126	1,386
6221	MBRG	50725	-S02 (P&H)	50730	5	102	510
7G02	ASML	50727	-S04 (R)	50740	13	45	585
2G01	MBRG	50808	None	--	0	61	0
XG03	VJCT	50923	None	--	0	85	0
DG05	VJCT	51001	None	--	0	90	0
MG02	VJCT	51023	None	--	0	78	0
XG05	VJCT	51132	None	--	0	93	0
6223	MBRG	51201	None	--	0	37	0
6207	MBRG	51205	None	--	0	44	0
CG05	VJCT	51225	None	--	0	32	0
5G02	ASML	51251	None	--	0	158	0
WG03	VJCT	51311	None	--	0	82	0
XG07	VJCT	51315	WG03 (R)	51326	11	57	627
GG05	VJCT	51353	None	--	0	24	0
VG03	VJCT	51402	GG05 (R)	51408	6	68	408
6211	MBRG	51410	NG03 (R)	51423	13	102	1,326
XG11	VJCT	51419	6211 (R)	51438	19	71	1,349
9G03	VJCT	51446	6207 (P&H)	51449	3	13	39

D.4 1985 Two-Yard Directional Gateway Yard Hold-Outs (continued)

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
-K01	VJCT	51459	None	--	0	77	0
DG03	VJCT	51503	-K01 (R)	51514	11	83	913
AG16	ASML	51517	DG03 (R)	51529	12	40	480
XG13	VJCT	51536	AG16 (R)	51544	8	50	400
MG04	VJCT	51605	None	--	0	73	0
XG09	VJCT	51616	MG04 (R)	51620	4	45	180
6M01	MBRG	51620	5G02 (P&H)	51621	1	87	87
6213	MBRG	51650	None	--	0	82	0
LG04	ASML	51757	None	--	0	141	0
2G03	MBRG	51904	None	--	0	95	0
6225	MBRG	51924	None	--	0	108	0
FG19	MBRG	51934	6225 (R)	51939	5	28	140
MG08	VJCT	52025	None	--	0	61	0
DG07	VJCT	52138	None	--	0	66	0
					135	3,243	9,040

D.5 2000 Two-Yard Directional Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
WG05	VJCT	42345	None	-	0	64	0
CG03	VJCT	42359	WG05 (R)	50000	1	66	66
6215	MBRG	50028	None	-	0	101	0
MG06	VJGT	50110	None	-	0	80	0
-S06	ASML	50113	None	-	0	73	0
-502	ASML	50225	None	-	0	114	0
-S02	ASML	50412	None	-	0	157	0
XG01	VJGT	50439	None	-	0	93	0
6219	MBRG	50528	None	-	0	120	0
XG21	VJCT	50710	None	-	0	30	0
-S04	ASML	50714	XG21 (R)	50725	11	140	1,540
6221	MBRG	50725	None	-	0	130	0
7G02	ASML	50727	-S04 (R)	50740	13	64	832
2G01	MBRG	50808	None	-	0	84	0
XG03	VJGT	50923	None	-	0	130	0
DG05	VJGT	51001	None	-	0	81	0
MG02	VJGT	51023	None	-	0	107	0
XG05	VJGT	51132	None	-	0	151	0
6223	MBRG	51201	XG05 (R)	51227	26	64	1,664
6207	MBRG	51205	6223 (R)	51242	37	78	2,886
CG05	VJGT	51225	XG05 (R,D)	51306	41	51	2,091
5G02	ASML	51251	6207 (R)	51257	6	138	828
WG03	VJGT	51311	5G02 (R)	51312	1	114	114
XG07	VJCT	51315	WG03 (R)	51327	12	90	1,080
GG05	VJCT	51353	None	-	0	37	0
VG03	VJCT	51402	GG05 (R)	51408	6	122	732
6211	MBRG	51410	VG03 (R)	51423	13	114	1,482
XG11	VJGT	51419	6223 (H)	51434	15	110	1,650
9G03	VJCT	51446	None	-	0	37	0
-K01	VJCT	51459	None	-	0	90	0
DG03	VJCT	51503	None	-	0	58	0
AG16	ASML	51517	DG03 (R)	51518	1	45	45
XG13	VJCT	51536	None	-	0	84	0
MG04	VJCT	51605	None	-	0	112	0
XG09	VJCT	51616	MG04 (R)	51620	4	68	272
6M01	MBRG	51620	XG09 (R)	51635	15	104	1,560
6213	MBRG	51650	None	-	0	132	0
PG19	MBRG	51734	None	-	0	43	0
LG04	ASML	51757	None	-	0	102	0
2G03	MBRG	51904	None	-	0	123	0
6225	MBRG	51924	None	-	0	100	0
MG08	VJGT	52025	None	-	0	87	0
DG07	VJGT	52138	None	-	0	48	0
XG72	VJCT	52300	None	-	0	81	0
					202	4,017	16,842

D.6 1985 Three-Yard Directional Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min	Cars	Car-Min
NG07	VJCT	42345	None	-	0	62	0
WG04	VJCT	42345	None	-	0	27	0
CG03	VJCT	42359	NG07(R)	50000	1	27	27
6215	MBRG	50028	None	-	0	102	0
-S06	ASML	50013	None	-	0	47	0
VG05	VJCT	50150	None	-	0	47	0
-S02	ASML	50225	None	-	0	147	0
-S02	ASML	50412	None	-	0	124	0
XG01	VJCT	50439	None	-	0	113	0
6219	MBRG	50528	None	-	0	74	0
VG01	VJCT	50530	None	-	0	50	0
XD01	VJCT	50536	VG01(R)	50545	9	93	837
XD05	VJCT	50543	6219(R)	50544	1	31	31
XG23	VJCT	50710	None	-	0	15	0
-S04	ASML	50714	XG23(R)	50725	11	126	1,386
6221	MBRG	50725	-S04(R)	50740	15	102	1,530
7G02	ASML	50727	6221(R)	50755	28	90	2,520
2G01	MBRG	50808	7G02(R)	50810	2	78	156
XG03	VJCT	50923	None	-	0	85	0
NG01	VJCT	51011	None	-	0	69	0
MG02	VJCT	50123	None	-	0	23	0
XG05	VJCT	51132	None	-	0	93	0
6223	MBRG	51201	None	-	0	37	0
6207	MBRG	51205	None	-	0	44	0
XD07	VJCT	51237	None	-	0	108	0
5G02	ASML	51251	XD07(R)	51252	1	158	158
WG02	VJCT	51311	None	-	0	82	0
XG07	VJCT	51315	WG02(R)	51326	11	57	627
GG05	VJCT	51353	None	-	0	19	0
VG03	VJCT	51402	GG05(R)	51408	6	47	282

D.6 1985 Three-Yard Directional Gateway Yard Hold-Outs (continued)

Train	Route	Arrival	Interference	Held To	Delay-Min	Cars	Car-Min
6211	MBRG	51410	VG03(R)	51423	13	102	1,326
XG11	VJCT	51419	6223(P&H)	51423	4	71	284
XD09	VJCT	51434	6211(R)	51438	4	45	180
NG03	VJCT	51435	XD09(R)	51453	18	50	900
9G03	VJCT	51446	6207(P&H)	51453	7	24	168
-K01	VJCT	51459	9G03(R)	51505	6	77	462
AG16	ASML	51517	None	-	0	37	0
XG13	VJCT	51536	None	-	0	50	0
XG09	VJCT	51616	None	-	0	45	0
6M01	MGRG	51620	XG09(R)	51631	11	87	957
XD15	VJCT	51635	6M01(R)	51646	11	60	660
XD13	VJCT	51637	5G02(P&H)	51653	16	29	464
6213	MBRG	51650	XD15(R)	51701	11	82	902
PG19	MBRG	51734	None	-	0	29	0
LG04	ASML	51757	None	-	0	141	0
NG05	VJCT	51853	None	-	0	57	0
2G03	MBRG	51904	None	-	0	67	0
6225	MBRG	51924	None	-	0	108	0
GG03	VJCT	52058	None	-	0	19	0
					186	3,357	13,857

D.7 2000 Three-Yard Directional Gateway Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
WC04	VJCT	42345	None	--	0	39	0
WG07	VJCT	42347	WG04 (R)	50000	13	88	1,144
GG03	VJGT	42359	None	--	0	40	0
6215	MBRG	50028	None	--	0	101	0
-S06	ASML	50113	None	--	0	74	0
VC05	VJCT	50150	None	--	0	68	0
-502	ASML	50225	None	--	0	114	0
-S02	ASML	50412	None	--	0	157	0
XG01	VJGT	50439	None	--	0	93	0
6219	MBRG	50528	None	--	0	120	0
VC01	VJCT	50530	None	--	0	74	0
XD01	VJCT	50536	6219 (R)	50543	7	100	700
XD05	VJCT	50543	VG01 (R)	50546	3	59	177
XG23	VJCT	50710	None	--	0	24	0
-S04	ASML	50714	None	--	0	140	0
6221	MBRG	50725	-S04 (R)	50736	11	130	1,430
7G02	ASML	50727	6221 (R)	50751	24	127	3,048
2C01	MBRG	50808	None	--	0	98	0
XC03	VJCT	50923	None	--	0	130	0
NG01	VJCT	51011	None	--	0	67	0
MG02	VJCT	51023	None	--	0	35	0
XG05	VJCT	51132	None	--	0	151	0
6223	MBRG	51201	XG05 (R)	51243	42	64	2,688
6207	MBRG	51205	6223 (R)	51258	53	78	4,134
XD07	VJCT	51237	6207 (R)	51313	36	76	2,736
5C02	ASML	51251	XD07 (R)	51328	37	138	5,106
WG02	VJCT	51311	XG03 (H)	51331	20	114	2,280
XG07	VJGT	51315	5C02 (R)	51343	28	90	2.520
GG05	VJCT	51353	None	--	0	37	0
VC03	VJCT	51402	None	--	0	67	0
6211	MBRG	51410	None	--	0	114	0
XC11	VJCT	51419	None	--	0	110	0
XD09	VJCT	51434	None	--	0	34	0
NC03	VJCT	51435	XD09 (R)	51439	14	77	1,078
9C03	VJCT	51446	NC03 (R)	51504	18	37	666
-K01	VJGT	51459	None	--	0	92	0
AG16	ASML	51517	None	--	0	53	0
XG13	VJCT	51536	None	--	0	84	0
XC09	VJCT	51616	None	--	0	68	0
6M01	MBRG	51620	XG09 (R)	51631	11	104	1,144
XD15	VJCT	51635	None	--	0	45	0
XD13	VJCT	51637	6M01 (R)	51646	9	19	171
6213	MBRG	51650	XD13 (R)	51701	11	132	1,452
PG19	MBRG	51734	None	--	0	43	0
LG04	ASML	51757	None	--	0	102	0
NC05	VJCT	51853	None	--	0	91	0
2G03	MBRG	51904	NG05 (R)	51908	4	102	408
6225	MBRG	51924	None	--	0	100	0
GG03	VJCT	52058	None	--	0	26	0
XG72	VJCT	52138	None	--	0	81	0
					341	4,207	30,882

D.8 1985 Three-Yard Bidirectional Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay - Minutes	Cars	Car-Minutes
CG20	VJCT	50020	None	--	0	52	0
-S06	ASML	50113	None	--	0	42	0
LG92	ASML	50200	None	--	0	160	0
LD02	ASML	50252	None	--	0	112	0
6D01	MBRG	50306	4D02(R)	50307	1	109	109
4E02	ASML	50409	None	--	0	8	0
-S02	ASML	50412	None	--	0	88	0
4G04	ASML	50433	None	--	0	24	0
XG01	VJCT	50439	4G04(R)	50448	9	113	1,017
4G02	ASML	50452	XG01(r)	50503	11	99	1,089
XD30	VJCT	50530	None	--	0	16	0
Xd01	VJCT	50536	XG30(R)	50545	9	73	657
XD05	VJCT	50543	XD01(R)	50600	17	10	170
-S04	ASML	50714	None	--	0	115	0
4Q04	ASML	50715	None	--	0	103	0
7G25	ASML	50735	None	--	0	48	0
2G11	MBRG	30820	None	--	0	40	0
XG03	VJCT	50923	None	--	0	85	0
MG26	VJCT	51020	None	--	0	19	0
XG05	VJCT	51132	None	--	0	93	0
CG12	VJCT	51145	None	--	0	42	0
LR04	ASML	51206	None	--	0	115	0
XD07	VJCT	51237	None	--	0	108	0
PG18	MBRG	51240	None	--	0	38	0
XG07	VJCT	51311	None	--	0	57	0
VG09	VJCT	51410	None	--	0	78	0
XG11	VJCT	51419	None	--	0	71	0
XD09	VJCT	51434	None	--	0	45	0
XG13	VJCT	51536	None	--	0	50	0
4E04	ASML	51541	XG13(R)	51551	10	24	240
XG09	VJCT	51616	None	--	0	45	0
XD13	VJCT	51635	None	--	0	29	0
LR02	ASML	51707	None	--	0	94	0
LG06	ASML	51716	None	--	0	116	0
LG04	ASML	51757	None	--	0	141	0
XD15	VJCT	51800	LG04(R)	51812	12	60	720
2G24	MBRG	51916	None	--	0	65	0
4R04	ASML	52040	None	--	0	39	0
NG22	VJCT	52340	None	--	0	80	0
VG23	VJCT	52350	None	--	0	63	0
					69	2,767	4,002

D.9 2000 Three-Yard Bidirectional Gateway Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay - Minutes	Cars	Car-Minutes
CG20	VJCT	50020	None	--	0	67	0
-S06	ASML	50113	None	--	0	62	0
LG92	ASML	50200	None	--	0	99	0
LD02	ASML	50252	None	--	0	155	0
6D01	MBRG	50306	LD02(R,D) -S06(P,H) 4E02(R)	50433	87	152	13,224
4E02	ASML	50409	None	--	0	12	0
-S02	ASML	50412	6D01(R)	50448	36	93	3,348
4G04	ASML	50433	-S02(R)	50503	30	112	3,360
XG01	VJCT	50439	4G04(R)	50518	39	93	3,627
4G02	ASML	50452	XG01(R)	50533	41	66	2,706
XG30	VJCT	50530	4G02(R)	50548	18	26	468
XD01	VJCT	50536	XG30(R)	50603	27	52	1,404
XD05	VJCT	50543	XD01(R)	50618	35	8	280
-S04	ASML	50714	None	--	0	123	0
4Q04	ASML	50715	None	--	0	96	0
7G25	ASML	50735	None	--	0	65	0
2G11	MBRG	50820	None	--	0	54	0
XG03	VJCT	50923	None	--	0	130	0
MG26	VJCT	51020	None	--	0	26	0
XG05	VJCT	51132	None	--	0	151	0
CG12	VJCT	51145	XG05(R)	51147	2	65	130
LR04	ASML	51206	None	--	0	148	0
XD07	VJCT	51237	None	--	0	76	0
PG18	MBRG	51240	XG05(D)	51248	8	52	416
XG07	VJCT	51311	None	--	0	90	0
VG09	VJCT	51410	None	--	0	112	0
XG11	VJCT	51419	VG09(R)	51425	6	110	660
XD09	VJCT	51434	CG12(P,H)	51437	3	34	102
LD82	ASML	51439	XG11(R)	51440	1	125	125
XG13	VJCT	51536	None	--	0	84	0
4E04	ASML	51541	XG13(R)	51551	10	37	370
XG09	VJCT	51616	None	--	0	68	0
XD13	VJCT	51635	None	--	0	19	0
LR02	ASML	51707	None	--	0	29	0
LG06	ASML	51716	LR02(R)	51722	6	153	918
LG04	ASML	51757	None	--	0	102	0
XD15	VJCT	51800	LG04(R)	51812	12	46	552
2G24	MBRG	51916	None	--	0	81	0
4R04	ASML	52040	None	--	0	56	0
XG72	VJCT	52138	None	--	0	81	0
NG22	VJCT	52340	None	--	0	48	0
VG23	VJCT	52350	None	--	0	94	0
					361	3,352	31,690

D.10 1979 No Build Madison Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
VM15	WL-CP	42355	None	-	0	63	0
CM19	WA-SH	50001	None	-	0	65	0
2M02	WA-SH	50024	None	-	0	46	0
BM03	WA-SH	50100	None	-	0	6	0
CM01	WA-SH	50121	None	-	0	39	0
CM03	WA-SH	50257	None	-	0	62	0
LM02	WR-SH	50333	2M02(H)	50339	6	55	330
L102	WR-SH	50408	CM01(H)	50427	19	50	950
HM02	WR-SH	50552	LM02(H)	50616	24	63	1,512
OM04	WR-SH	50755	HM02(R,H)	50826	31	40	1,240
LM04	WR-SH	50841	None	-	0	32	0
2M03	WA-SH	50850	LM04(R)	50855	5	40	200
RM10	WL-CP	51111	MV08(C)	51132	21	37	777
SM10	WL-CP	51116	RM10(R)	51147	31	33	1,023
VM05	WL-CP	51136	SM10(R)	51211	25	24	600
6207	WA-SH	51205	None	-	0	17	0
2M05	WA-SH	51219	None	-	0	82	0
6223	WA-SH	51340	None	-	0	29	0
7M10	QT-CP	51400	None	-	0	74	0
2M01	WA-SH	51411	VM05(R)	51428	17	37	629
CM09	WA-SH	51540	6223(R)	51545	5	32	160
2M08	WA-SH	51555	CM09(R)	51559	4	21	84
1C05	QT-CP	51557	None	-	0	20	0
WM03	WA-SH	51636	None	-	0	45	0
2M07	WA-SH	51905	None	-	0	56	0
6M01	WA-SH	51940	None	-	0	78	0
CM07	WA-SH	52000	None	-	0	31	0
HM06	WR-SH	52115	CM07(R,H)	52147	32	12	384
FM11	WL-CP	52200	MU02(C)	52229	29	59	1,711
					249	1,248	9,600

D.11 1985 No Build Madison Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
VM15	WL-CP	42355	None	-	0	70	0
CM19	WA-SH	50001	FM11(R)	50021	20	66	1,320
2M02	WA-SH	50024	CM19(R)	50039	15	53	795
BM03	WA-SH	50100	None	-	0	6	0
CM01	WA-SH	50121	None	-	0	43	0
CM03	WA-SH	50257	None	-	0	74	0
LM02	WR-SH	50333	None	-	0	65	0
L102	WR-SH	50408	CM01(R,H)	50440	32	54	1,728
HM02	WR-SH	50552	LM02(H)	50606	14	70	980
OM04	WR-SH	50755	HM02(R,H)	50834	39	48	1,872
LM04	WR-SH	50841	OM04(R)	50850	9	37	333
2M03	WA-SH	50850	LM04(R)	50905	15	46	690
RM10	WL-CP	51111	MF04(C)	51153	42	43	1,806
SM10	WL-CP	51116	RM10(R)	51208	52	39	2,028
VM05	WL-CP	51136	SM10(R)	51223	47	27	1,269
6207	WA-SH	51205	None	-	0	20	0
2M05	WA-SH	51219	None	-	0	104	0
6223	WA-SH	51340	None	-	0	37	0
7M10	QT-CP	51400	MV10(C)	51507	67	82	5,494
2M01	WA-SH	51411	None	-	0	52	0
CM09	WA-SH	51540	7M01(R)	51545	5	37	185
2M08	WA-SH	51555	CM09(R); 2M05(R)	51604	9	26	234
1C05	QT-CP	51557	MV10(C)	51605	8	24	184
WM03	WA-SH	51636	None	-	0	53	0
2M07	WA-SH	51905	None	-	0	67	0
6M01	WA-SH	51940	None	-	0	87	0
CM07	WA-SH	52000	1C05(R)	52002	2	36	72
HM06	WR-SH	52115	None	-	0	14	0
FM11	WL-CP	52200	None	-	0	70	0
					376	1,450	18,990

D.12 2000 No Build Madison Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
VM15	WL-CP	42355	M204(C)	50001	6	102	612
2M02	WA-SH	50024	None	-	0	72	0
BM03	WA-SH	50100	FM11(R)	50116	16	9	144
LM02	WR-SH	50333	None	-	0	68	0
L102	WR-SH	50408	None	-	0	68	0
HM02	WR-SH	50552	L102(PR,H)	50629	37	93	3,441
OM04	WR-SH	50755	None	-	0	41	0
LM04	WR-SH	50841	HM02(R,H); OM04(R,H)	50923	42	51	2,142
OM06	WR-SH	50845	LM04(R)	50934	49	33	1,617
2M03	WA-SH	50850	OM06(R)	50944	54	114	6,156
RM10	WL-CP	51111	MW04(C)	51119	8	57	456
SM10	WL-CP	51116	RM10(R)	51130	14	6	84
VM05	WL-CP	51136	M222(C)	51234	58	43	2,494
6207	WA-SH	51205	None	-	0	36	0
2M05	WA-SH	51219	2M03(R)	51228	9	133	1,197
6223	WA-SH	51340	None	-	0	64	0
7M10	QT-CP	51400	None	-	0	114	0
2M01	WA-SH	51411	7M10(R)	51501	50	99	4,950
2M08	WA-SH	51555	None	-	0	46	0
1C05	QT-CP	51557	None	-	0	36	0
WM03	WA-SH	51636	None	-	0	69	0
2M07	WA-SH	51905	None	-	0	114	0
6M01	WA-SH	51940	None	-	0	104	0
HM06	WR-SH	52115	2M07(R,H)	52138	23	22	506
FM11	WL-CP	52200	None	-	0	113	0
					366	1,707	23,799

D.13 1985 Two-Yard Directional Madison Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
CM03	WA-SH	50033	None	-	0	87	0
BM01	WA-SH	50054	None	-	0	34	0
LG92	WR-SH	50156	None	-	0	171	0
WM05	WA-SH	50309	None	-	0	34	0
L102	QT-CP	50356	None	-	0	122	0
4G04	QT-CP	50450	None	-	0	107	0
GM01	QT-CP	50458	4G04 (R)	50510	12	56	672
VM10	QT-CP	50610	None	-	0	89	0
EF04	QT-CP	50639	None	-	0	104	0
4Q04	QT-CP	50727	None	-	0	103	0
GM03	QT-CP	50742	None	-	0	61	0
-L02	WR-SH	50928	None	-	0	98	0
LM04	QT-CP	51000	None	-	0	106	0
DM03	QT-CP	51022	None	-	0	34	0
GM05	QT-CP	51119	None	-	0	44	0
7M10	QT-CP	51214	None	-	0	51	0
LR04	QT-CP	51215	7M10 (R)	51230	15	118	1,770
GM07	QT-CP	51433	None	-	0	51	0
WM03	WA-SH	51444	None	-	0	48	0
BM07	WA-SH	51450	WM03 (R)	51500	10	52	520
4R06	QT-CP	51509	None	-	0	12	0
4E04	QT-CP	51552	None	-	0	24	0
VM04	QT-CP	51651	None	-	0	102	0
LR02	WR-SH	51653	None	-	0	22	0
CM05	WA-SH	51758	None	-	0	13	0
GM09	QT-CP	51803	None	-	0	75	0
XM01	QT-CP	51910	None	-	0	23	0
HM06	WR-SH	51920	None	-	0	14	0
4R04	QT-CP	52052	None	-	0	39	0
GM11	QT-CP	52056	4R04 (R)	52107	11	94	1,034
TM37	QT-CP	52147	None	-	0	5	0
CM19	WA-SH	52157	4R04 (R)	52204	7	46	322
FM11	QT-CP	52200	None	-	0	21	0
					55	2,060	4,318

D.14 2000 Two-Yard Directional Madison Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min.	Cars	Car-Min.
CM03	WA-SH	50033	FM11 (R)	50050	17	105	1,785
BM01	WA-SH	50054	CM03 (R)	50110	16	54	864
LG92	WR-SH	50156	None	-	0	108	0
WM05	WA-SH	50309	None	-	0	46	0
L102	QT-CP	50356	None	-	0	160	0
4G04	QT-CP	50450	None	-	0	112	0
GM01	QT-CP	50458	4G04 (R)	50511	13	78	1,014
VM10	QT-CP	50610	None	-	0	99	0
EF04	QT-CP	50639	None	-	0	137	0
4Q04	QT-CP	50727	None	-	0	96	0
GM03	QT-CP	50742	4Q04 (R)	50747	5	96	480
-L02	WR-SH	50928	None	-	0	102	0
LM04	QT-CP	51000	None	-	0	143	0
DM03	QT-CP	51022	None	-	0	31	0
GM05	QT-CP	51119	None	-	0	75	0
7M10	QT-CP	51214	None	-	0	71	0
LR04	QT-CP	51215	None	-	0	164	0
GM07	QT-CP	51433	None	-	0	85	0
WM03	WA-SH	51444	GM05 (R)	51456	12	63	756
BM07	WA-SH	51450	WM03 (R)	51513	23	65	1,495
4R06	QT-CP	51509	None	-	0	16	0
4E04	QT-CP	51552	None	-	0	37	0
VM04	QT-CP	51651	None	-	0	98	0
LR02	WR-SH	51653	None	-	0	29	0
CM05	WA-SH	51758	None	-	0	63	0
GM09	QT-CP	51803	None	-	0	118	0
XM01	QT-CP	51910	None	-	0	37	0
HM06	WR-SH	51920	4E04 (R)	51936	16	22	352
AC72	WR-SH	52020	None	-	0	79	0
4R04	QT-CP	52052	None	-	0	56	0
GM11	QT-CP	52056	4R04 (R)	52108	12	49	588
TM37	QT-CP	52147	None	-	0	6	0
CM19	WA-SH	52157	None	-	0	21	0
FM11	QT-CP	52200	None	-	0	27	0
					114	2,548	7,334

D.15 1985 Three-Yard Directional/Bidirectional Madison Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
BM03	WA-SH	42313	None	--	0	54	0
IM16	WA-SH*	42330	None	--	0	11	0
IM20	WA-SH*	50415	None	--	0	25	0
GM01	QT-CP	50450	None	--	0	79	0
IM18	WA-SH*	50625	None	--	0	15	0
NM03	QT-CP	50720	None	--	0	60	0
GM03	QT-CP	50742	None	--	0	52	0
GM05	QT-CP	51112	None	--	0	59	0
NM05	QT-CP	51313	None	--	0	74	0
GM07	QT-CP	51331	None	--	0	104	0
IM08	WA-SH	51350	None	--	0	18	0
IM10	WL-CP	51425	None	--	0	17	0
WM02	WA-SH	51444	None	--	0	56	0
BM05	WA-SH	51449	WM02 (R)	51500	11	31	341
4R06	QT-CP	51510	None	--	0	12	0
FM02	WA-SH*	51610	None	--	0	4	0
VM03	QT-CP	51651	None	--	0	79	0
XM03	QT-CP	51741	None	--	0	17	0
HM06	WR-SH	51920	4R06 (H)	51930	31	14	434
IM12	WA-SH*	52105	None	--	0	19	0
FM08	WA-SH*	52200	None	--	0	17	0
IM14	WA-SH*	52220	None	--	0	16	0
					42	833	775

*Trains from the "Wiggins Mainline" that shove into the receiving yard using the West Approach tracks.

D.16 2000 Three-Yard Directional/Bidirectional Madison Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
BM03	WA-SH	42313	None	--	0	72	0
IM16	WA-SH*	42330	BM03 (R)	42331	1	11	11
IM20	WA-SH*	50415	None	--	0	25	0
GM01	QT-CP	50450	None	--	0	67	0
IM18	WA-SH*	50625	None	--	0	15	0
NM03	QT-CP	50720	None	--	0	86	0
GM03	QT-CP	50742	NM03 (R)	50759	17	83	1,411
GM05	QT-CP	51112	None	--	0	96	0
NM05	QT-CP	51313	None	--	0	98	0
GM07	QT-CP	51331	NM05 (R)	51337	6	39	234
IM08	WA-SH*	51350	None	--	0	18	0
IM10	WL-CP	51425	None	--	0	17	0
WM02	WA-SH	51444	None	--	0	75	0
BM05	WA-SH	51449	WM02 (R)	51502	13	48	624
4R06	QT-CP	51510	MG048 (PC)	51552	42	16	672
FM02	WA-SH*	51610	None	--	0	7	0
VM03	QT-CP	51651	None	--	0	57	0
XM03	QT-CP	51741	None	--	0	27	0
HM06	WR-SH	51921	None	--	0	22	0
AC72	WR-SH	52022	MC01 (C); 4R06 (P,H)	52100	38	79	3,002
IM12	WA-SH *	52105	XM03 (PR)	52128	23	19	437
FM08	WA-SH *	52200	None	--	0	20	0
IM14	WA-SH *	52220	None	--	0	16	0
					140	1,013	6,391

*Trains from the "Wiggins Mainline" that shove into the receiving yard using the West Approach tracks.

D.17 1985 Three-Yard Directional New Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
MN04	WA-SH	42320	None	--	0	60	0
GN11	QTOW	50006	None	--	0	30	0
GN05	WA-SH	50035	None	--	0	87	0
LG92	WR-SH	50200	None	--	0	170	0
GN13	QTOW	50310	None	--	0	42	0
L102	ROLK	50345	DX108(C), 26248(C), 26728(C)	50436	51	122	6,222
LD02	ROLK	50435	None	--	0	112	0
4G04	ROLK	50443	L102(R), 26248, DX728,26748, NG019, 26228(C)	50630	107	107	11,449
2N01	QTOW	50447	L102(R)	50504	17	77	1,309
4G02	ROLK	50507	2N01(R)	50528	21	99	2,079
L208	ROLK	50545	4G02(R)	50554	9	77	693
VN01	QTOW	50548	L208(R), 4G04(R)	50657	69	49	3,381
4E02	ROLK	50605	VN01 (R), NC049, R4018, N1039, DX168(C)	50827	142	8	1,136
-C01	WA-SH	50615	None	--	0	97	0
EF04	ROLK	50628	4E02(R), DX188, NM059, VX148(C)	51051	263	104	27,352
GN01	QTOW	50650	VN01(R)	50719	29	72	2,088
4Q04	ROLK	50715	EF04(R), 26768, NG039, NX028,NW049(C)	51249	334	103	34,402
LW08	WR-SH	50800	None	--	0	70	0
-L02	WR-SH	50925	None	--	0	98	0
LM04	ROLK	50946	4Q04(R), DX748, NV029,DX768, K-028(C)	51402	256	106	27,136
GN03	QTOW	51026	None	--	0	72	0
LR04	ROLK	51206	LM04(R), NC069,K-028, DX208(C)	51546	220	118	25,960
GN05	QTOW	51400	LM04(R)	51428	28	34	952
MN02	WA-SH	51405	None	--	0	60	0
VN03	QTOW	51438	GN05 (R)	51448	10	53	530
2N03	QTOW	51534	LR04(R)	51613	39	43	1,677
4E04	ROLK	51541	None	--	0	24	0
XN03	QTOW	51645	None	--	0	5	0
LR02	WR-SH	51707	None	--	0	22	0
GN07	QTOW	51738	None	--	0	72	0
PN19	QTOW	51815	None	--	0	12	0
GN09	QTOW	52035	None	--	0	73	0
4R04	ROLK	52040	GN09(R), DX048(C)	52120	40	39	1,560
LM08	ROLK	52050	4R04(R), VX028(C), DX068(C), NW029(C)	52250	120	25	3,000
					1,755	2,342	150,026
					1533 because of class track interference.		

D.18 2000 Three-Yard Directional New Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN.	CARS	CAR-MIN.
MN04	WA-SH	42320	4R04 (PR)	42328	8	79	632
GN11	QTOW	50006	None	--	0	51	0
CN05	WA-SH	50035	None	--	0	78	0
LG92	WR-SH	50200	None	--	0	108	0
GN13	QTOW	50310	None	--	0	62	0
LI02	ROLK	50345	DX10N (C), 26249 (C)	50447	62	160	9,920
LD02	ROLK	50435	None	--	0	155	0
4G04	ROLK	50443	DX72N (C)	50641	118	112	13,216
2N01	QTOW	50447	LI02 (R) (wait for C); 4G02 (R)	50531	44	74	3,256
4G02	ROLK	50507	None	--	0	66	0
L206	ROLK	50545	4G04 (R) (wait for C); RL018 (C)	50739	114	102	11,628
VN01	QTOW	50548	2N01 (R) (wait for C)	50555	7	69	483
4E02	ROLK	50605	VN01 (R)	50612	14	12	168
-C01	WA-SH	50615	None	--	0	149	0
EF04	ROLK	50628	DX168 (C), DX188 (C), NM059 (C)	50934	186	137	25,482
GN01	QTOW	50650	None	--	0	98	0
4Q04	ROLK	50715	VX148 (C), EF04(R) (wait for C)	51116	241	96	23,136
LW08	WR-SH	50800	LI02 (P)	50802	2	92	184
-L02	WR-SH	50925	None	--	0	102	0
LM04	ROLK	50946	4Q04 (R) (wait for C); NV028 (C)	51228	162	143	23,166
GN03	QTOW	51026	None	--	0	92	0
LR04	ROLK	51206	LM04 (R) (wait for C)	51341	95	164	15,580
GN05	QTOW	51400	LR04 (R) (wait for C)	51412	12	69	828
MN02	WA-SH	51405	None	--	0	89	0
VN03	QTOW	51438	None	--	0	73	0
2N03	QTOW	51534	None	--	0	44	0
4E04	ROLK	51541	2N03 (R), K-029 (C), PX208 (C), 26369 (C)	51638	57	37	2,109
LD82	WR-SH	51600	None	--	0	129	0
LG06	ROLK	51639	None	--	0	153	0
XN03	QTOW	51645	4E04 (R) (waiting for C)	51659	14	8	112
LR02	WR-SH	51707	GN03 (P), LG06 (D)	51734	27	29	783
GN07	QTOW	51738	None	--	0	90	0
CN03	WA-SH	51805	MN02 (P)	51817	12	67	804
PN19	QTOW	51815	None	--	0	21	0
GN09	QTOW	52035	None	--	0	80	0
4R04	ROLK	52040	GN09 (R), DX048 (C)	52118	38	56	2,128
LM08	ROLK	52050	NW029 (C), 4R04 (R)	52316	146	68	9,928
					1,359	3,214	143,543

1283 because of Class Track Interference

Table D. 19: 1985 Three-Yard Bidirectional New Yard Hold-Outs

TRAIN	ROUTE	ARRIVAL	INTERFERENCE	HELD TO	DELAY-MIN	CARS	CAR-MIN
GN22	QTOW	50025	None	--	0	86	0
6215	QTOW	50028	None	--	0	102	0
CN10	WA-SH	50104	None	--	0	51	0
-502	WR-SH	50225	None	--	0	147	0
WN21	WA-SH	50330	CN10(PR)	50334	4	56	224
L102	ROLK	50345	None	--	0	122	0
MN26	WA-SH	50420	None	--	0	45	0
6219	QTOW	50528	None	--	0	62	0
L206	ROLK	50556	None	--	0	74	0
VN23	QTOW	50610	L206(R)	50620	10	55	550
-C01	WA-SH	50615	None	--	0	97	0
EF04	ROLK	50628	VN23(R), MN26(PR), 5-038(C)	50713	45	46	2,070
LW08	WR-SH	50724	None	--	0	70	0
6221	QTOW	50725	6219(PR), EF04(R)	50738	13	102	1,326
-L02	WR-SH	50925	None	--	0	98	0
LM04	ROLK	50946	None	--	0	36	0
6207	QTOW	51028	None	--	0	44	0
2N11	QTOW	51052	None	--	0	32	0
6223	QTOW	51201	None	--	0	37	0
5G02	WR-SH	51251	None	--	0	156	0
6209	QTOW	51320	None	--	0	26	0
6211	QTOW	51410	None	--	0	102	0
GN14	QTOW	51415	6211(R)	51436	21	29	609
-K01	WA-SH	51459	None	--	0	62	0
4R06	ROLK	51510	None	--	0	12	0
WN11	WA-SH	51516	None	--	0	48	0
6M01	QTOW	51620	None	--	0	87	0
6213	QTOW	51650	4R06(PR)	51707	17	81	1,377
XN30	QTOW	51655	None	--	0	4	0
CN18	WA-SH	51830	-K01(PR)	51838	8	46	368
MN18	WA-SH	51830	CN18(R)	51859	29	46	1,334
PN13	QTOW	51850	None	--	0	13	0
6225	QTOW	51924	None	--	0	108	0
WN16	WA-SH	51945	None	--	0	82	0
7H25	WR-SH	52055	None	--	0	56	0
					147	2,320	7,858

D.20 2000 Three-Yard Bidirectional New Yard Hold-Outs

Train	Route	Arrival	Interference	Held To	Delay-Min	Cars	Car-Min
GN22	QTOW	80025	None	-	0	90	0
6215	QTOW	80028	None	-	0	101	0
CN10	WA-SH	80104	None	-	0	101	0
-502	WR-SH	80225	None	-	0	114	0
WN21	WA-SH	80330	None	-	0	80	0
L102	ROLK	80345	None	-	0	160	0
MN26	WA-SH	80420	None	-	0	69	0
6219	QTOW	80528	None	-	0	98	0
L206	ROLK	80556	5-038 (C)	80631	35	98	3,430
VN23	QTOW	80610	L206 (R)	80657	47	77	3,619
-C01	WA-SH	80615	VN23 (R)	80700	45	149	6,705
EF04	ROLK	80628	None	-	0	54	0
LW08	WR-SH	80724	-C01 (R)	80731	7	92	644
6221	QTOW	80725	None	-	0	130	0
-L02	WR-SH	80925	None	-	0	102	0
6285	QTOW	80944	None	-	0	130	0
LM04	ROLK	80946	6285 (R), NW139 (C)	81045	59	50	2,950
6207	QTOW	81028	LM04 (R)	81107	39	78	3,042
2N11	QTOW	81052	6207 (R)	81132	40	58	2,320
6223	QTOW	81201	None	-	0	64	0
6283	QTOW	81223	6223 (R)	81224	1	63	63
5G02	WR-SH	81251	None	-	0	138	0
6209	QTOW	81320	None	-	0	46	0
6211	QTOW	81410	None	-	0	114	0
GN14	QTOW	81415	None	-	0	78	0
-K01	WA-SH	81459	6223 (P)	81506	7	74	518
4R06	ROLK	81510	None	-	0	16	0
WN11	WA-SH	81516	-K01 (R)	81530	14	61	854
6M01	QTOW	81620	None	-	0	104	0
6213	QTOW	81650	None	-	0	132	0
XN30	QTOW	81655	None	-	0	6	0
CN18	WA-SH	81830	WN11 (P)	81836	6	61	366
MN18	WA-SH	81830	CN18 (R)	81859	29	73	2,117
PN13	QTOW	81850	None	-	0	23	0
6225	QTOW	81924	None	-	0	100	0
WN16	WA-SH	81945	None	-	0	114	0
7N25	WR-SH	82055	None	-	0	89	0
					329	3,187	26,628

APPENDIX E

Daily Yard Operating Costs

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ROAD KEY

Road ID	Carrier Name
AS	Alton & Southern
BO	Chessie
BN	Burlington Northern
CR	Conrail
CW	Chicago & North Western
IC	Illinois Central Gulf
IT	Illinois Terminal
LN	Louisville & Nashville
MK	Missouri-Kansas-Texas
MP	Missouri Pacific
MS	Manufacturers
NW	Norfolk & Western
NY	New Yard
RI	Rock Island
SF	St. Louis-San Francisco
SO	Southern
SW	St. Louis Southwestern
TR	Terminal Railroad Association

NOTE: Costs shown for switch carrier traffic, A&S, TRAA and New Yard were allocated among the "line-haul" roads whose cars made up that traffic (i.e., transfer trains).

E.1 Daily Yard Operating Costs for 1979 No Build Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	1455	447	1616	2064	728	4700	5428	660	510	3048	13165
BN	260	80	288	368	130	838	968	118	91	636	2441
BO	375	115	417	532	188	1212	1399	170	131	820	3427
CR	335	103	372	474	167	1081	1248	152	117	880	3206
CW	230	71	256	326	115	743	858	104	81	491	2090
IC	82	25	92	117	41	266	307	37	29	166	738
LN	39	12	44	56	20	127	147	18	14	104	378
MP	321	99	357	455	161	1037	1198	146	112	746	2978
MS	119	37	133	169	60	385	445	54	42	237	1066
NW	295	91	328	419	148	953	1101	134	103	551	2603
SW	808	248	898	1146	405	2610	3015	367	283	1850	7469
TR	25	8	27	35	12	79	92	11	9	56	228
TOT	4344	1335	4826	6161	2175	14031	16206	1971	1522	9585	39789
/CAR	2.46	.76	2.73	3.49	1.23	7.95	9.18	1.12	.86	5.43	22.53

E.2 Daily Yard Operating Costs for 1985 No Build Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	1453	481	1704	2185	783	4940	5723	659	533	3283	13836
BN	250	83	293	376	135	850	985	113	92	611	2427
BO	321	106	376	482	173	1090	1263	145	118	794	3123
CR	321	106	376	482	173	1090	1263	145	118	1017	3346
CW	258	85	302	388	139	876	1015	117	95	597	2470
IC	86	28	101	129	46	292	338	39	32	147	771
LN	41	13	48	61	22	139	161	18	15	121	417
MP	257	85	301	386	138	873	1011	116	94	661	2525
MS	121	40	142	182	65	412	477	55	44	285	1164
NW	298	99	350	449	161	1015	1176	135	110	686	2854
SW	852	282	1000	1282	460	2899	3358	387	313	2273	8465
TR	87	29	102	131	47	296	343	39	32	186	818
TOT	4344	1438	5094	6532	2342	14770	17112	1971	1595	10661	42216
/CAR	2.20	.73	2.58	3.31	1.19	7.49	8.68	1.00	.81	5.41	21.41

E.3 Daily Yard Operating Costs for 2000 No Build Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	1625	634	2406	3040	1032	6352	7384	958	687	4809	18503
BN	208	81	308	389	132	812	944	122	88	701	2452
BO	244	95	362	457	155	956	1111	144	103	642	2701
CR	234	91	347	438	149	915	1064	138	99	709	2682
CW	245	96	364	459	156	960	1116	145	104	632	2701
IC	105	41	155	196	67	410	476	62	44	282	1165
LN	52	20	77	97	33	203	236	31	22	176	614
MP	172	67	254	321	109	672	781	101	73	525	1973
MS	125	49	185	233	79	487	566	73	53	327	1377
NW	223	87	330	417	142	871	1013	131	94	624	2502
SW	936	365	1387	1752	595	3661	4256	552	396	2560	10452
TR	176	69	260	329	112	686	798	104	74	367	1848
TOT	4344	1695	6434	8129	2760	16985	19745	2562	1836	12354	48970
/CAR	1.89	.74	2.80	3.53	1.20	7.38	8.58	1.11	.80	5.37	21.28

E.4 Daily Yard Operating Costs for 1985 Two-Yard Directional Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	2289	436	1664	2099	710	4583	5292	611	552	3480	14323
BN	334	64	243	307	104	669	773	89	81	476	2060
BO	558	106	406	512	173	1118	1291	149	135	866	3511
CR	1170	223	851	1073	363	2343	2706	313	282	1730	7274
CW	1029	196	748	944	319	2060	2379	275	248	1500	6375
IC	243	46	177	223	75	487	562	65	59	363	1515
LN	300	57	218	275	93	600	693	80	72	477	1897
MK	128	24	93	117	40	255	295	34	31	212	817
MP	686	131	499	629	213	1373	1586	183	165	1209	4458
MS	91	17	66	84	28	183	211	24	22	175	607
NW	469	89	341	430	145	939	1084	125	113	815	3036
SF	1091	208	793	1001	338	2184	2523	291	263	1763	6932
SO	1093	208	794	1002	339	2188	2527	292	263	1665	6842
SW	913	174	664	838	283	1829	2112	244	220	1389	5716
TR	670	128	487	615	208	1342	1550	179	162	931	4107
TOT	11065	2106	8043	10149	3430	22155	25585	2956	2667	17051	69470
/CAR	3.45	.66	2.51	3.16	1.07	6.90	7.97	.92	.83	5.31	21.64

E.5 Daily Yard Operating Costs for 2000 Two-Yard Directional Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	2505	523	1821	2345	852	6020	6872	759	668	4823	17972
BN	246	51	179	230	84	591	675	75	66	512	1804
BO	621	130	451	581	211	1491	1702	188	165	1308	4565
CR	1248	261	907	1168	425	3000	3424	378	333	2285	8836
CW	516	108	375	483	176	1240	1416	156	138	928	3637
IC	161	34	117	151	55	387	442	49	43	376	1222
LN	346	72	252	324	118	832	950	105	92	698	2515
MK	130	27	95	122	44	313	357	39	35	263	946
MF	583	122	423	545	198	1400	1598	176	155	1246	4303
MS	116	24	84	108	39	279	318	35	31	282	890
NW	488	102	355	456	166	1172	1338	148	130	963	3523
SF	1149	240	836	1076	391	2762	3153	348	306	2271	8303
SO	1041	217	756	974	354	2500	2854	315	277	1969	7430
SW	1113	232	809	1041	379	2674	3052	337	297	2179	8019
TR	802	168	583	750	273	1926	2199	243	214	1448	5656
TOT	11065	2312	8043	10355	3764	26586	30350	3351	2950	21551	79621
/CAR	2.83	.59	2.06	2.65	.96	6.79	7.76	.86	.75	5.51	20.35

E.6 Daily Yard Operating Costs for 1985 Three-Yard Directional Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	2712	479	1972	2450	779	5250	6029	725	638	4214	16768
BN	385	68	280	348	111	746	857	103	91	576	2360
BO	496	88	361	448	143	961	1103	133	117	776	3073
CR	1050	185	763	948	302	2032	2334	280	247	1579	6438
CW	961	169	698	868	276	1860	2136	257	226	1422	5870
IC	242	43	176	219	70	469	539	65	57	330	1452
LN	293	52	213	264	84	567	651	78	69	435	1790
MK	130	23	94	117	37	251	288	35	30	229	829
MP	867	153	630	783	249	1677	1926	231	204	1430	5441
MS	135	24	98	122	39	261	299	36	32	234	858
NW	375	66	273	339	108	726	834	100	88	627	2363
NY	400	71	291	362	115	775	890	107	94	617	2470
SF	1055	186	767	953	303	2042	2345	282	248	1636	6519
SO	919	162	668	830	264	1778	2042	245	216	1473	5725
SW	877	155	637	792	252	1697	1949	234	206	1407	5465
TR	168	30	122	152	48	326	374	45	40	233	1012
TOT	11065	1952	8043	9995	3179	21417	24596	2956	2602	17218	68433
/CAR	3.37	.59	2.45	3.04	.97	6.51	7.48	.90	.79	5.24	20.81

E.7 Daily Yard Operating Costs for 2000 Three-Yard Directional Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	2777	593	2153	2746	966	6857	7823	890	761	5657	20654
BN	278	59	216	275	97	688	785	89	76	582	2085
BO	530	113	411	525	184	1310	1494	170	145	1095	3959
CR	1075	230	834	1064	374	2656	3030	345	295	2178	7987
CW	587	125	455	581	204	1451	1655	188	161	1124	4296
IC	271	58	210	268	94	668	762	87	74	484	1946
LN	322	69	250	319	112	796	908	103	88	600	2340
MK	122	26	95	121	42	301	344	39	33	262	921
MP	739	158	573	730	257	1824	2081	237	202	1673	5662
MS	145	31	112	143	50	357	407	46	40	323	1104
NW	432	92	335	428	150	1068	1218	139	118	949	3284
NY	428	91	332	424	149	1058	1207	137	117	847	3160
SF	1101	235	853	1088	383	2718	3101	353	302	2465	8410
SO	932	199	723	922	324	2302	2626	299	255	1971	7005
SW	1101	235	853	1088	383	2718	3101	353	302	2254	8199
TR	224	48	174	222	78	553	631	72	61	431	1641
TOT	11065	2363	8579	10942	3848	27325	31173	3548	3031	22895	82653
/CAR	2.65	.57	2.06	2.62	.92	6.55	7.47	.85	.73	5.49	19.81

E.8 Daily Yard Operating Costs for 1985 Three-Yard Bidirectional Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	281	55	203	257	89	599	688	88	70	318	1702
BN	413	80	298	378	131	881	1012	130	103	526	2562
BO	538	105	388	492	170	1148	1318	169	134	775	3426
CR	2042	397	1471	1867	646	4352	4997	641	508	3065	13120
CW	487	95	351	445	154	1038	1192	153	121	643	3041
IC	259	50	187	237	82	552	634	81	64	321	1596
MP	1911	371	1377	1748	605	4073	4678	600	475	3142	12554
MS	276	54	199	252	87	588	675	86	69	277	1635
NW	388	75	279	355	123	826	949	122	96	638	2548
NY	147	29	106	134	47	313	360	46	37	168	892
SD	939	182	677	859	297	2001	2299	295	233	1156	5781
SO	733	142	528	671	232	1563	1795	230	182	1045	4656
SW	1239	241	892	1133	392	2640	3032	389	308	1700	7801
TR	395	77	285	361	125	842	967	124	98	536	2481
TOT	10048	1952	7239	9191	3179	21417	24596	3153	2498	14310	63795
/CAR	3.68	.71	2.65	3.36	1.16	7.83	9.00	1.15	.91	5.23	23.33

E.9 Daily Yard Operating Costs for 2000 Three-Yard Bidirectional Gateway Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	1320	256	1021	1278	418	2813	3231	414	332	2275	8850
BN	313	61	242	303	99	666	765	98	79	585	2143
BO	644	125	498	623	204	1372	1576	202	162	1217	4424
CR	1904	370	1473	1843	602	4058	4660	597	479	3781	13264
CW	453	88	350	438	143	965	1108	142	114	944	3199
IC	314	61	243	304	99	670	769	99	79	739	2304
MP	1773	344	1372	1716	561	3779	4339	556	446	3605	12435
MS	205	40	159	198	65	437	501	64	52	297	1317
NW	422	82	327	409	134	899	1033	132	106	822	2924
NY	74	14	57	72	23	158	181	23	19	108	477
SO	647	126	501	626	205	1379	1583	203	163	1187	4409
SW	1519	295	1175	1470	480	3237	3717	477	382	2775	10340
TR	462	90	358	447	146	985	1131	145	116	805	3106
TOT	10048	1952	7775	9727	3179	21417	24596	3153	2529	19140	69192
/CAR	3.08	.60	2.38	2.98	.97	6.57	7.54	.97	.78	5.87	21.21

E.10 Daily Yard Operating Costs for 1979 No Build Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
CR	285	93	277	370	151	1019	1170	136	104	605	2670
IC	83	27	81	108	44	298	343	40	30	174	778
IT	151	49	147	196	80	540	620	72	55	271	1365
MF	131	43	128	170	70	469	539	63	48	246	1197
NW	60	19	58	77	32	213	245	28	22	118	550
SF	61	20	59	79	32	218	250	29	22	122	563
TR	2531	826	2466	3293	1346	9059	10405	1208	925	4757	23119
TOT	3302	1078	3217	4295	1756	11816	13572	1576	1206	6293	30242
/CAR	2.65	.86	2.58	3.44	1.41	9.48	10.88	1.26	.97	5.05	24.25

E.11 Daily Yard Operating Costs for 1985 No Build Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
CR	273	110	288	398	180	1220	1399	146	118	646	2980
IT	140	57	148	204	92	625	718	75	60	346	1543
MP	127	51	134	185	84	568	652	68	55	272	1359
NW	59	24	63	87	39	266	305	32	26	174	683
SF	66	27	70	97	44	297	341	36	29	169	738
TR	2637	1066	2783	3849	1737	11794	13531	1417	1140	5788	28362
TOT	3302	1335	3485	4820	2175	14770	16945	1774	1428	7395	35665
/CAR	2.33	.94	2.46	3.40	1.53	10.42	11.96	1.25	1.01	5.22	25.17

E.12 Daily Yard Operating Costs for 2000 No Build Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
CR	211	92	223	315	150	1040	1190	126	98	509	2449
IT	157	68	165	233	111	770	881	93	72	320	1756
MF	139	61	147	208	99	685	784	83	64	356	1634
NW	70	31	74	105	50	345	395	42	32	157	801
SF	83	36	88	124	59	410	469	50	39	192	957
TR	2641	1150	2788	3938	1873	12996	14869	1577	1222	5971	30218
TOT	3302	1438	3485	4923	2342	16247	18589	1971	1528	7505	37815
/CAR	2.03	.89	2.15	3.03	1.44	10.00	11.45	1.21	.94	4.62	23.29

E.13 Daily Yard Operating Costs for 1985 Two-Yard Directional Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	517	129	572	701	209	1438	1648	165	163	834	4028
BO	317	79	351	430	129	883	1012	101	100	420	2380
CR	564	140	624	765	229	1570	1799	180	178	933	4419
IC	178	44	197	241	72	495	567	57	56	284	1383
IT	69	17	77	94	28	193	221	22	22	125	553
LN	141	35	156	191	57	393	450	45	45	246	1118
MK	106	26	117	143	43	294	337	34	33	196	849
MP	193	48	213	261	78	536	614	61	61	349	1539
NW	426	106	471	577	173	1185	1358	136	135	790	3422
RI	91	23	101	123	37	253	290	29	29	157	719
SF	564	140	624	765	229	1570	1799	180	178	908	4394
SW	222	55	246	302	90	619	709	71	70	278	1652
TO	7	2	8	9	3	19	22	2	2	17	59
TR	2177	542	2409	2951	882	6059	6941	693	688	3706	17156
TOT	5571	1387	6166	7553	2258	15508	17766	1774	1760	9243	43671
/CAR	2.71	.68	3.00	3.68	1.10	7.55	8.65	.86	.86	4.50	21.26

E.14 Daily Yard Operating Costs for 2000 Two-Yard Directional Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	562	166	650	816	270	1939	2209	219	204	1401	5411
BO	257	76	297	373	124	886	1010	100	93	555	2388
CR	635	188	734	921	305	2190	2496	247	231	1318	5848
IC	247	73	285	358	119	851	970	96	90	517	2278
IT	52	15	60	75	25	178	203	20	19	147	516
LN	141	42	163	205	68	488	556	55	51	430	1438
MK	94	28	109	137	45	325	370	37	34	243	915
MP	150	44	174	218	72	519	591	59	55	365	1438
NW	335	99	386	485	161	1153	1314	130	122	718	3104
RI	115	34	132	166	55	395	450	45	42	243	1061
SF	717	212	829	1040	345	2473	2817	279	261	1687	6801
SW	240	71	277	348	115	828	944	94	87	542	2255
TO	7	2	8	10	3	23	26	3	2	20	68
TR	2018	595	2330	2925	969	6954	7923	785	733	4654	19038
TOT	5571	1644	6434	8078	2677	19201	21878	2168	2025	12840	52559
/CAR	2.25	.66	2.59	3.26	1.08	7.74	8.82	.87	.82	5.18	21.18

E.15 Daily Yard Operating Costs for 1985 Three-Yard Directional/Bidirectional Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	511	127	415	542	207	1372	1580	214	150	871	3868
CR	24	6	19	25	10	64	73	10	7	30	169
NW	91	23	74	97	37	245	282	38	27	176	711
NY	359	89	291	381	145	963	1108	150	105	501	2604
TR	2317	577	1881	2458	939	6218	7157	968	680	3194	16774
TOT	3302	822	2681	3503	1338	8862	10200	1379	969	4772	24126
/CAR	3.96	.99	3.22	4.21	1.61	10.64	12.24	1.66	1.16	5.73	28.96

E.16 Daily Yard Operating Costs for 2000 Three-Yard Directiona/Bidirectional Madison Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	465	130	416	546	212	1457	1669	222	153	796	3851
CR	26	7	23	31	12	82	94	12	9	43	215
IC	129	36	115	151	59	404	463	62	42	179	1026
NW	122	34	109	144	56	383	439	58	40	324	1127
NY	300	84	268	352	137	941	1078	143	99	316	2288
TR	2258	632	2017	2649	1029	7072	8101	1078	741	3754	18581
TOT	3302	924	2949	3873	1505	10339	11844	1576	1084	5412	27088
/CAR	3.27	.91	2.92	3.83	1.49	10.23	11.72	1.56	1.07	5.35	26.79

E.17 Daily Yard Operating Costs for 1985 Three-Yard Directional New Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	584	130	452	582	212	1401	1613	199	158	970	4106
BO	360	80	278	358	130	863	993	123	98	578	2510
CR	1003	223	777	1000	363	2407	2770	343	272	1916	7304
IC	150	33	116	150	54	360	415	51	41	277	1084
LN	155	34	120	154	56	371	427	53	42	359	1190
MK	111	25	86	111	40	267	308	38	30	302	900
MP	1276	284	988	1272	462	3063	3525	436	346	2643	9498
NW	429	96	333	428	156	1030	1186	147	116	769	3075
NY	1255	279	972	1252	455	3013	3468	429	341	2340	9085
RI	245	55	190	244	89	588	677	84	66	481	1797
SF	732	163	567	730	265	1758	2023	250	199	1285	5219
SW	315	70	244	314	114	756	870	108	85	540	2232
TR	308	68	238	307	111	738	850	105	83	558	2211
TOT	6923	1541	5362	6903	2509	16616	19125	2365	1878	13018	50211
/CAR	2.97	.66	2.30	2.96	1.08	7.13	8.21	1.02	.81	5.59	21.55

E.18 Daily Yard Operating Costs for 2000 Three-Yard Directional New Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	584	139	588	727	226	1557	1783	233	176	1543	5046
BO	275	65	277	342	106	734	840	110	83	712	2362
CR	1223	290	1232	1522	473	3262	3735	487	369	3069	10405
IC	154	37	155	191	59	410	470	61	46	422	1344
LN	148	35	149	185	57	396	453	59	45	468	1358
MK	108	26	109	135	42	289	331	43	33	315	965
MP	1203	286	1211	1497	465	3207	3672	479	363	3320	10534
NW	426	101	429	530	165	1135	1300	170	129	1256	3811
NY	1212	288	1221	1509	469	3233	3702	483	366	3275	10547
RI	267	63	268	332	103	711	814	106	80	903	2502
SF	765	182	770	952	296	2040	2336	305	231	1715	6304
SW	220	52	221	274	85	587	672	88	66	481	1801
TR	338	80	340	421	131	901	1032	135	102	793	2821
TOT	6923	1644	6971	8615	2677	18462	21139	2759	2090	18272	59800
/CAR	2.17	.51	2.18	2.70	.84	5.78	6.62	.86	.65	5.72	18.72

E.19 Daily Yard Operating Costs for 1985 Three-Yard Bidirectional New Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	157	42	146	189	69	459	527	59	50	304	1286
BO	255	68	238	307	111	746	857	96	81	478	2074
CR	600	161	561	722	262	1754	2017	225	190	1074	4828
CW	476	128	445	572	208	1392	1600	178	151	923	3900
IC	75	20	70	90	33	219	252	28	24	117	586
IT	76	21	71	92	33	223	257	29	24	173	651
LN	307	82	287	369	134	897	1031	115	97	529	2448
MK	203	55	190	244	89	594	683	76	64	434	1704
MP	394	106	368	474	172	1152	1325	148	125	872	3338
MS	18	5	17	21	8	52	60	7	6	29	141
NW	389	104	363	467	170	1136	1306	146	123	788	3219
NY	902	242	842	1084	394	2636	3030	338	286	1587	7227
RI	232	62	217	279	101	678	779	87	74	446	1897
SF	1423	382	1329	1710	622	4159	4781	533	451	2599	11497
SO	143	38	134	172	63	419	481	54	45	300	1195
TR	666	179	622	800	291	1946	2237	249	211	1237	5400
TOT	6318	1695	5898	7593	2760	18462	21222	2365	2002	11890	51391
/CAR	2.73	.73	2.55	3.28	1.19	7.97	9.17	1.02	.86	5.14	22.20

E.20 Daily Yard Operating Costs for 2000 Three-Yard Bidirectional New Yard

Road ID	MOW Cost	MOE (Locomotives)	MOE (Car Inspection)	Total MOE Cost	Transportation (Fuel)	Transportation (Crews)	Total Transportation Cost	Equipment Capital Cost	Administration Cost	Car Cost	Total Cost
AS	170	53	195	248	86	558	644	74	61	527	1724
BO	288	89	330	419	145	943	1088	126	102	741	2764
CR	650	201	745	946	327	2128	2455	284	231	1714	6280
CW	333	103	381	484	167	1089	1256	145	118	908	3244
IC	78	24	89	114	39	256	295	34	28	199	748
IT	90	28	103	131	45	295	341	39	32	298	931
LN	310	96	356	452	156	1016	1172	136	110	806	2986
MK	194	60	222	282	97	634	732	85	69	652	2014
MP	385	119	442	561	194	1262	1456	168	137	1172	3879
MS	23	7	27	34	12	76	88	10	8	52	215
NW	373	115	428	543	188	1222	1410	163	133	1099	3721
NY	797	246	914	1160	401	2610	3011	348	283	2154	7753
RI	244	76	280	356	123	800	923	107	87	653	2370
SF	1567	484	1796	2280	789	5130	5918	684	556	4291	15296
SO	126	39	144	183	63	412	475	55	45	334	1218
TR	687	212	787	999	346	2248	2593	300	244	1570	6393
TOT	6318	1952	7239	9191	3179	20678	23857	2759	2243	17170	61536
/CAR	2.03	.63	2.32	2.95	1.02	6.64	7.66	.89	.72	5.51	19.76

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Daily Corridor Operating Costs

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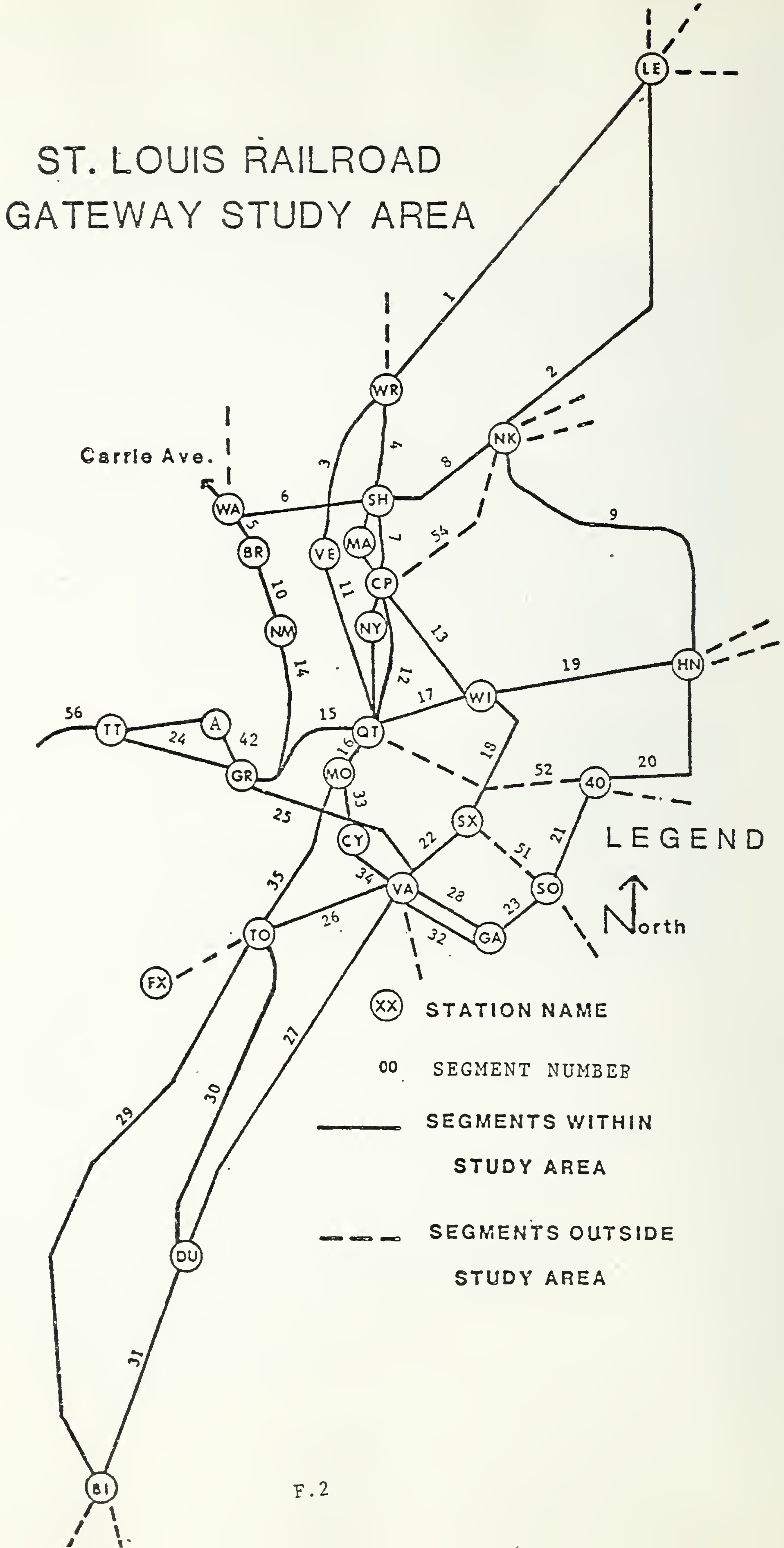

ST. LOUIS RAILROAD GATEWAY STUDY AREA

STATION KEY

Code	Station Name
LE	Lenox
NK	NKP Tower
HN	HN Cabin
40	40th St. L&N
SO	Southern Junction
GA	Gateway Yard
VA	Valley Junction
TO	Tolson
FX	Fox
WR	WR Tower
SH	SH Tower
CP	CP Junction
WI	Willows
SX	Southern Crossing
DU	Dupo
BI	Bixby
VE	Venice
QT	Q Tower
WA	West Approach
BR	Bremen
NM	North Market
GR	Gratiot
TT	Tower 2
CY	"C" Yard
NY	New Yard
ID	ID Tower
MO	MO Junction
MA	Madison
NG	North End Gateway Yard
A	Amtrak

Source: CONSAD Research Corporation.

LINK KEY

Link Number	Route	Owning or Operating Railroad	Number of Main Tracks	Mileage
1	Lenox - WR	CR/ICG/NW	4	6.1
2	Lenox - NKP Tower	A&S	1	6.2
3	WR - Venice	CR/ICG/NW	3	3.2
4	WR - SH	TRRA	2	1.7
5	West Approach - Bremen	TRRA	2	0.4
6	West Approach - SH	TRRA	2	1.6
7	SH - CP	TRRA	2	1.2
8	SH - NKP Tower	TRRA/CNW/NW	1	1.4
9	NKP Tower - HN Cabin	A&S	1/2	4.9
10	Bremen - North Market	TRRA	2	1.2
11	Venice - Q Tower	CR/ICG/TRRA	2	1.8
12	CP Jct. - Q Tower	TRRA/IT/CNW/NW	3.	2.4
13	CP Jct. - Willows	TRRA	2	2.2
14	North Market - Gratiot	TRRA	2	2.9
15	Q Tower - Gratiot	City of St. Louis	2	1.4
17	Q Tower - Willows	CR/BO	2/3	2.0
18	Willows - Southern Crossing	TRRA	2	2.6
19	Willows - HN Cabin	CR/BO	3	2.9
20	HN Cabin - 40th St. L&N	A&S	2	3.2
21	40th St. L&N - Southern	A&S	2	2.2
22	Southern Crossing - Valley Junction	TRRA	2	1.1
23	Soutern - Gateway	A&S	3	0.5
24	Gratiot - Tower Two	TRRA/MP	2	1.7
25	Gratiot - Valley	City of St. St. Louis	2	2.9
26	Valley - Tolson	A&S	1/2	2.4
27	Valley - Dupo	MP	3/2	7.3
28	Valley - Gateway	A&S	2	1.5
29	Tolson - Bixby	ICG	1	10.3
30	Tolson - Dupo	TRRA	2/1	6.3
31	Dupo - Bixby	MP	2	2.2
32	Gateway - Valley	A&S	3	0.2
33	M&O Jct. - C Yard	ICG	2	1.1
34	C Yard - Valley	ICG	2	1.8
35	Q Tower - Tolson	TRRA/ICG	2	4.8
42	Gratiot - Amtrak	TRRA	1	0.2

Road Key

Road ID	Carrier Name
AS	Alton & Southern
AT	Amtrak
BN	Burlington Northern
BO	Baltimore & Ohio
CR	Conrail
CW	Chicago & North Western
IC	Illinois Central Gulf
IT	Illinois Terminal
KT	Missouri-Kansas-Texas
LN	Louisville & Nashville
MP	Missouri Pacific
NW	Norfolk & Western
NY	New Yard Transfers
RI	Chicago, Rock Island & Pacific
SF	St. Louis-San Francisco
SO	Southern Railway
SW	St. Louis Southwestern
TO	TOFC Yard Transfers
TR	Terminal Railroad Association of St. Louis

Source: CONSAD Research Corporation

F.1 Daily Operating Costs by Link for 1979 No Build Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	1148.80	924.91	1210.42	4236.52	473.27	298.68	8292.60	176.44	3.24
2	371.86	435.87	614.45	2076.74	216.34	264.55	3979.81	361.80	4.68
3	259.92	263.90	407.75	1250.33	133.06	87.21	2402.18	141.30	2.71
4	246.37	516.49	635.27	2475.95	242.91	164.28	4281.27	115.71	2.27
5	31.27	186.38	225.54	899.60	83.79	59.16	1485.74	42.45	.98
6	279.77	803.22	945.55	3824.57	368.07	239.43	6460.59	97.89	2.19
7	73.41	190.72	238.03	917.48	88.62	54.24	1562.49	91.91	2.18
8	12.75	0.	0.	2.47	0.	0.	15.22	0.	0.
9	401.85	685.83	891.98	3285.64	328.00	321.00	5914.30	347.90	4.97
10	127.52	376.44	430.89	1800.65	172.85	120.43	3028.79	81.86	1.83
11	107.11	225.16	350.83	1085.64	106.34	89.56	1964.64	151.13	2.63
12	50.99	0.	0.	9.87	0.	0.	60.87	0.	0.
13	228.56	636.44	706.37	3052.00	293.77	189.15	5106.29	159.57	3.34
14	283.59	507.33	577.36	2388.84	238.48	157.78	4153.38	129.79	2.81
15	31.73	13.93	16.57	71.73	8.80	8.02	150.78	150.78	1.73
17	115.36	72.35	96.46	352.71	40.53	24.98	702.39	100.34	1.85
18	212.08	333.65	364.18	1573.47	158.94	103.39	2745.71	114.40	2.43
19	259.45	268.02	432.68	1267.22	134.60	96.68	2458.65	129.40	2.46
20	429.27	883.22	1346.42	4247.24	416.98	441.72	7764.86	277.32	3.70
21	301.85	780.49	1166.00	3767.40	363.73	397.51	6776.98	225.90	3.12
22	58.24	152.56	181.74	736.12	71.02	45.38	1245.06	88.93	2.14
23	75.52	746.76	1221.33	3658.63	336.07	390.98	6429.29	189.10	2.68
24	309.83	574.65	721.15	2730.57	271.13	221.98	4829.32	98.56	1.63
25	293.79	541.58	790.14	2592.08	257.06	249.96	4724.60	205.42	3.04

F.1 Daily Operating Costs by Link for 1979 No Build Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	58.11	66.49	39.01	321.57	33.46	4.75	523.41	104.68	9.02
27	1469.52	1224.53	1682.25	5630.33	624.33	500.43	11131.40	241.99	3.37
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	165.62	67.59	35.11	335.33	42.64	4.45	650.74	325.37	27.11
30	102.27	64.12	59.13	314.01	36.03	16.64	592.19	296.10	7.40
31	448.10	368.67	543.48	1698.02	188.61	166.83	3413.71	77.58	.96
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	79.88	146.86	247.06	710.50	70.29	59.91	1314.50	93.89	1.78
34	143.01	173.84	263.58	833.02	86.24	72.55	1572.24	104.82	1.72
35	114.77	196.90	152.05	961.85	95.51	33.82	1554.89	388.72	14.95
42	.27	10.93	6.83	52.23	4.76	.33	75.34	12.56	2.60

F.2 Daily Operating Costs by Link for 1985 No Build Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	984.68	687.11	885.75	3177.99	363.73	264.09	6363.37	192.83	3.13
2	284.97	182.43	209.22	852.87	99.02	76.47	1704.97	213.12	2.95
3	299.75	190.21	299.01	904.47	104.58	94.29	1892.32	157.69	1.95
4	216.08	407.23	436.65	1951.22	193.09	127.50	3331.78	107.48	2.18
5	35.95	289.40	359.42	1407.62	129.97	116.85	2339.21	68.80	1.35
6	311.76	984.56	1190.78	4722.10	451.38	363.80	8024.38	125.38	2.42
7	87.52	213.05	260.45	1025.88	99.48	80.04	1766.42	98.13	1.86
8	12.75	0.	0.	2.47	0.	0.	15.22	0.	0.
9	397.03	748.95	1085.80	3603.05	356.18	349.80	6540.80	408.80	5.67
10	145.37	443.43	520.86	2130.66	203.96	163.89	3608.17	97.52	1.87
11	106.65	224.45	338.77	1084.52	106.17	101.82	1962.39	163.53	2.64
12	58.48	9.02	9.20	51.15	8.90	3.13	139.88	139.88	2.29
13	290.72	898.61	1100.59	4337.68	414.53	405.30	7447.43	219.04	3.57
14	331.19	508.04	589.53	2392.35	242.37	191.48	4254.96	132.97	2.40
15	40.89	26.44	31.29	131.50	14.91	18.73	263.76	131.88	1.23
17	144.72	94.60	145.64	459.66	52.42	53.95	950.99	118.87	1.43
18	230.75	341.66	365.98	1619.78	164.41	130.57	2853.16	129.69	2.24
19	358.39	256.92	427.15	1204.89	136.51	127.81	2511.67	119.60	1.51
20	492.24	1092.10	1719.10	5267.74	513.91	614.68	9699.78	323.33	3.94
21	346.28	989.21	1659.50	4789.78	459.39	625.11	8869.27	277.16	3.48
22	58.19	150.82	165.73	730.46	70.46	49.53	1225.19	102.10	2.11
23	84.41	751.04	1237.67	3679.70	338.64	451.66	6543.12	192.44	2.40
24	474.70	723.41	967.30	3438.64	347.76	343.01	6294.80	104.91	1.34
25	495.25	801.81	1244.15	3835.66	384.95	427.92	7189.74	217.87	2.60

F.2 Daily Operating Costs by Link for 1985 No Build Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	59.46	102.84	63.88	500.61	49.72	12.02	788.54	157.71	11.43
27	2114.71	2167.27	3317.69	10187.51	1085.21	1145.80	20018.19	363.97	4.11
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	168.26	76.14	40.96	377.46	46.64	6.29	715.75	357.88	24.68
30	105.17	66.25	61.89	324.54	37.20	20.46	615.51	307.76	6.92
31	658.55	490.41	745.67	2265.75	256.10	256.46	4672.94	84.96	.90
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	86.07	139.73	175.56	675.39	67.59	53.35	1197.69	85.55	1.41
34	153.97	195.93	277.40	941.85	96.88	93.46	1759.49	117.30	1.70
35	118.21	191.20	142.09	933.76	93.24	34.56	1513.05	378.26	12.82
42	.27	9.50	5.85	45.21	4.12	.30	65.25	10.88	2.25

F.3 Daily Operating Costs by Link for 2000 No Build Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	1249.59	916.32	1193.94	4226.47	479.43	382.51	8448.25	196.47	2.93
2	382.33	234.99	292.99	1095.37	128.45	120.86	2254.99	225.50	2.55
3	318.51	257.49	396.44	1218.74	134.61	116.08	2441.87	143.64	1.96
4	278.90	490.20	562.39	2348.71	233.84	193.09	4107.12	114.09	1.91
5	49.31	311.81	407.85	1517.48	140.89	162.33	2589.67	73.99	1.13
6	422.77	1283.78	1646.05	6185.54	591.91	648.00	10778.06	156.20	2.36
7	101.40	224.45	279.50	1082.05	105.59	106.39	1899.38	105.52	1.62
8	12.75	0.	0.	2.47	0.	0.	15.22	0.	0.
9	492.04	881.81	1359.24	4251.08	421.87	517.75	7923.79	466.11	5.46
10	196.35	500.91	595.46	2405.87	232.73	225.80	4157.12	98.98	1.56
11	130.22	242.98	381.63	1173.40	116.00	130.18	2174.41	167.26	2.18
12	63.39	9.02	9.20	51.15	9.27	5.17	147.21	147.21	1.46
13	413.09	1071.53	1373.17	5172.03	499.25	580.34	9109.40	227.74	2.85
14	435.25	561.23	665.79	2642.90	272.95	259.31	4837.44	138.21	2.03
15	48.98	39.66	61.65	194.78	21.26	28.57	394.90	131.63	1.20
17	174.08	129.27	213.29	622.53	69.44	76.88	1285.48	116.86	1.35
18	356.35	434.51	506.33	2056.58	213.56	226.43	3793.76	135.49	1.70
19	495.01	362.76	603.25	1699.40	191.79	217.15	3569.35	127.48	1.38
20	636.95	1249.74	2114.26	6027.35	593.55	824.35	11446.21	336.65	3.50
21	449.82	1118.74	1963.61	5416.23	523.86	798.94	10271.19	285.31	3.03
22	77.15	163.81	181.38	792.97	77.54	78.89	1371.74	105.52	1.49
23	107.58	1055.90	1866.78	5178.16	475.62	717.74	9401.78	241.07	2.65
24	740.37	936.65	1314.85	4435.20	458.42	509.56	8395.06	99.94	1.14
25	826.61	1202.54	1999.72	5733.03	582.16	707.56	11051.61	208.52	2.33

F.3 Daily Operating Costs by Link for 2000 No Build Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	63.76	102.84	63.88	500.61	50.04	18.34	799.47	159.89	7.69
27	3269.97	2991.33	4822.62	14005.71	1520.03	1736.80	28346.45	354.33	3.72
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	175.11	76.14	40.96	377.46	47.15	9.10	725.92	362.96	17.28
30	102.59	66.25	61.89	324.54	37.00	19.14	611.42	305.71	7.55
31	1014.19	713.36	1109.71	3285.55	375.98	396.31	6895.10	84.09	.87
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	102.84	149.87	198.77	723.86	73.24	70.68	1319.25	87.95	1.15
34	184.35	209.47	309.49	1006.15	105.00	122.66	1937.13	121.07	1.42
35	119.44	226.83	166.47	1109.29	109.17	41.50	1772.70	443.18	14.41
42	.27	9.50	5.85	45.21	4.12	.30	65.25	10.88	2.25

F.4 Daily Operating Costs by Link for 1985 Two-Yard Directional Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	727.13	474.64	401.76	2029.13	242.32	109.56	3984.53	94.87	1.70
2	232.17	143.86	146.59	654.65	77.30	40.19	1294.76	143.86	2.44
3	316.11	168.42	170.22	726.05	90.79	62.01	1533.60	54.77	.83
4	90.84	142.94	158.56	664.37	67.36	35.46	1159.53	55.22	1.34
5	28.87	50.26	56.46	233.86	23.47	20.54	413.47	17.23	.28
6	302.00	300.03	319.12	1388.14	149.26	93.37	2551.93	48.15	.82
7	21.44	47.96	49.70	222.88	21.92	7.13	371.04	37.10	1.62
8	10.20	0.	0.	2.47	0.	0.	12.67	0.	0.
9	440.55	226.77	238.97	1016.28	126.27	100.03	2148.87	113.10	1.33
10	86.97	73.59	67.24	332.57	36.99	21.25	618.61	28.12	.50
11	143.80	138.16	136.09	621.41	67.75	40.01	1147.23	40.97	.75
12	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	35.16	67.35	79.84	313.47	31.20	7.60	534.63	66.83	3.26
14	215.44	162.14	157.64	730.56	83.11	55.44	1404.33	66.87	1.10
15	43.43	60.55	63.18	286.58	29.29	17.66	500.69	55.63	1.25
17	174.93	167.07	214.06	766.78	83.16	67.53	1473.53	58.94	.90
18	73.55	168.52	123.01	797.83	77.99	16.50	1257.40	96.72	5.93
19	273.14	198.18	198.10	862.13	100.01	47.88	1679.44	50.89	.90
20	448.85	255.89	301.03	1143.19	138.59	105.01	2392.57	72.50	.90
21	324.14	148.09	156.74	639.64	83.39	50.30	1402.29	38.95	.49
22	29.94	90.40	69.27	431.37	41.38	9.33	671.70	51.67	3.17
23	88.06	198.96	346.86	958.58	93.42	111.19	1797.06	44.93	.56
24	396.61	327.16	433.96	1484.24	165.60	144.75	2952.32	49.21	.61
25	497.20	375.69	535.85	1717.38	194.27	181.67	3502.05	92.16	1.01

F.4 Daily Operating Costs by Link for 1985 Two-Yard Directional Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	45.51	36.33	20.97	179.34	19.59	3.57	305.30	101.77	6.36
27	1526.60	842.09	987.68	3707.81	455.74	342.90	7862.82	157.26	1.89
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	446.08	163.03	158.80	710.21	98.95	54.78	1631.84	181.32	2.12
30	205.30	95.42	95.53	426.56	54.55	35.03	912.38	130.34	1.63
31	501.25	289.15	373.77	1296.28	156.50	145.42	2762.35	58.77	.60
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	139.42	186.71	184.73	870.04	89.71	61.32	1531.93	37.36	.70
34	239.62	240.74	234.20	1103.28	118.77	75.20	2011.81	47.90	.86
35	357.14	125.98	89.26	528.63	75.88	30.26	1207.16	67.06	.89
42	.22	10.21	6.34	48.72	4.44	.32	70.25	11.71	2.42

F.5 Daily Operating Costs by Link for 2000 Two-Yard Directional Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	866.17	514.75	458.25	2202.55	268.76	140.52	4451.00	98.91	1.53
2	286.86	134.59	129.00	609.01	77.28	42.68	1279.42	142.16	1.87
3	402.24	216.37	236.35	936.88	116.66	79.23	1987.73	58.46	.80
4	100.23	152.29	158.52	712.66	72.39	45.43	1241.52	62.08	1.24
5	30.45	46.70	57.92	216.30	22.01	19.70	393.09	15.12	.23
6	368.18	303.50	337.07	1394.66	154.98	119.51	2677.90	46.17	.65
7	22.33	42.74	41.58	198.74	19.79	6.88	332.04	36.89	1.34
8	10.20	0.	0.	2.47	0.	0.	12.67	0.	0.
9	641.82	344.59	369.69	1531.89	188.87	143.43	3220.29	111.04	1.34
10	112.94	94.72	100.52	428.74	47.73	32.78	817.44	30.28	.46
11	182.25	163.10	178.36	737.09	81.18	60.77	1402.76	45.25	.68
12	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	37.32	59.91	69.02	279.73	28.27	8.76	483.02	69.00	2.57
14	264.90	193.39	210.40	869.21	99.56	70.09	1707.54	68.30	1.02
15	50.30	60.55	63.18	286.58	29.81	24.31	514.73	57.19	.99
17	225.18	175.93	221.86	805.15	90.47	81.37	1599.96	59.26	.71
18	98.44	160.68	115.05	759.22	76.38	32.37	1242.14	95.55	2.79
19	356.92	198.18	198.10	862.13	106.29	65.23	1786.85	54.15	.69
20	617.15	332.48	411.43	1476.20	182.09	143.18	3164.53	73.59	.83
21	447.05	184.71	195.43	790.96	106.70	67.67	1792.52	38.97	.44
22	40.47	88.26	67.81	420.84	41.22	19.33	677.94	52.15	1.52
23	113.90	282.96	522.30	1367.79	132.35	185.09	2604.39	55.41	.59
24	582.21	474.68	662.01	2152.52	240.71	233.40	4345.52	50.53	.59
25	738.96	641.87	966.31	2948.15	324.67	321.62	5941.59	100.70	1.11

F.5 Daily Operating Costs by Link for 2000 Two-Yard Directional Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	48.95	36.33	20.97	179.34	19.85	6.29	311.72	103.91	3.76
27	2200.64	1169.23	1420.66	5107.04	635.77	482.00	11015.33	152.99	1.77
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	554.40	201.40	198.14	871.98	122.08	76.08	2024.08	184.01	1.97
30	238.81	108.94	116.96	484.88	62.45	43.17	1055.22	131.90	1.53
31	692.21	430.87	573.51	1923.04	228.46	200.84	4048.93	56.24	.61
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	168.27	208.41	211.79	974.00	101.30	77.99	1741.75	40.51	.62
34	282.49	257.84	258.66	1182.75	129.23	95.94	2206.91	50.16	.76
35	436.10	143.77	101.87	597.23	88.28	36.42	1403.68	66.84	.80
42	.22	10.21	6.34	48.72	4.44	.32	70.25	11.71	2.42

F.6 Daily Operating Costs by Link for 1985 Three-Yard Directional Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	720.14	485.84	463.88	2108.49	248.58	133.27	4160.20	106.67	1.79
2	231.41	130.31	128.67	587.95	71.23	36.27	1185.84	131.76	2.25
3	287.73	188.31	196.60	832.47	98.14	61.81	1665.26	64.05	.98
4	91.26	178.03	195.22	841.70	83.32	41.83	1431.35	75.33	1.64
5	7.02	29.76	29.67	139.75	13.24	6.29	225.73	17.36	.56
6	231.70	192.22	198.61	882.41	97.98	52.16	1655.08	40.37	.78
7	18.25	47.49	59.33	223.74	21.71	5.77	376.29	47.04	2.29
8	10.20	0.	0.	2.47	0.	0.	12.67	0.	0.
9	453.18	225.25	212.73	995.83	125.57	82.46	2095.02	99.76	1.24
10	41.07	44.39	34.49	203.01	21.64	7.96	352.56	27.12	.89
11	142.55	177.37	207.70	819.28	85.44	62.40	1494.74	57.49	.98
12	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	35.16	51.68	56.13	236.23	24.23	5.27	408.71	51.09	2.49
14	97.51	75.80	61.45	343.58	38.77	16.03	633.15	57.56	1.73
15	97.91	185.47	225.14	874.17	86.82	70.12	1539.62	64.15	1.14
17	190.23	302.38	415.26	1422.77	143.65	123.49	2597.79	89.58	1.42
18	73.55	145.00	103.88	681.98	67.54	14.01	1085.96	83.54	5.12
19	289.52	154.00	126.76	644.47	81.60	34.54	1330.88	40.33	.66
20	463.52	228.81	272.55	1009.79	127.66	90.55	2192.88	66.45	.79
21	316.13	143.50	156.95	619.94	80.97	51.78	1369.26	39.12	.49
22	29.94	79.00	59.31	375.20	36.31	8.02	587.78	45.21	2.77
23	86.24	236.65	429.44	1145.58	110.14	138.12	2146.16	56.48	.68
24	395.16	310.52	392.56	1395.53	157.59	129.25	2780.62	44.14	.57
25	483.90	393.50	567.51	1805.14	201.19	196.67	3647.93	96.00	1.09

F.6 Daily Operating Costs by Link for 1985 Three-Yard Directional Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	51.40	99.26	57.54	473.48	46.81	9.36	737.85	92.23	6.83
27	1411.30	693.59	741.76	3014.88	383.98	257.29	6502.82	141.37	1.73
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	744.48	288.40	278.73	1232.53	169.91	102.89	2816.94	176.06	1.91
30	145.49	49.14	67.11	231.90	31.99	27.13	552.76	184.25	1.69
31	415.84	238.82	321.26	1072.94	129.57	119.38	2297.81	58.92	.61
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	160.44	268.65	298.18	1260.60	126.73	90.16	2204.75	44.10	.83
34	270.19	356.16	389.22	1650.45	170.76	121.74	2958.52	58.01	1.07
35	458.50	215.98	201.90	946.59	121.58	71.39	2015.94	91.63	1.08
42	.22	13.06	8.29	62.77	5.70	.43	90.46	15.08	3.12

F.7 Daily Operating Costs by Link for 2000 Three-Yard Directional Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	874.40	553.57	545.50	2409.92	287.84	174.55	4845.78	112.69	1.65
2	250.69	130.31	128.67	587.95	72.67	41.57	1211.86	134.65	2.01
3	378.15	223.75	240.53	985.93	119.09	83.10	2030.55	65.50	.88
4	107.95	162.98	191.36	765.32	77.72	52.27	1357.60	67.88	1.22
5	11.97	35.38	39.14	166.38	16.03	9.90	278.81	18.59	.46
6	299.50	226.33	246.62	1039.89	117.43	83.16	2012.93	43.76	.66
7	21.98	47.49	59.33	223.74	21.99	8.18	382.71	47.84	1.59
8	10.20	0.	0.	2.47	0.	0.	12.67	0.	0.
9	625.87	368.82	422.61	1651.26	198.45	138.98	3405.99	117.45	1.43
10	59.12	55.79	48.56	254.39	27.70	14.08	459.64	28.73	.69
11	176.73	185.20	215.12	855.51	91.31	74.91	1598.77	59.21	.81
12	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	42.00	54.53	58.52	250.28	26.01	7.21	438.54	54.82	1.83
14	132.46	93.92	87.16	425.19	48.87	25.19	812.79	62.52	1.45
15	126.72	202.33	257.33	951.66	96.05	87.06	1721.16	63.75	.93
17	248.01	512.93	825.85	2454.66	241.17	298.40	4581.03	147.78	1.81
18	98.44	145.00	103.88	681.98	69.41	29.66	1128.38	86.80	2.53
19	378.52	160.00	129.90	666.39	90.37	44.78	1469.97	42.00	.53
20	637.45	301.12	367.91	1323.73	169.67	125.91	2925.79	68.04	.74
21	441.10	183.37	207.71	790.19	106.10	70.24	1798.71	40.88	.45
22	40.47	78.29	58.82	371.69	36.78	16.76	602.82	46.37	1.35
23	110.65	311.71	567.44	1511.38	145.03	222.86	2869.08	65.21	.67
24	589.31	463.74	632.73	2091.90	235.87	221.38	4234.94	47.58	.57
25	727.57	777.28	1248.91	3615.18	384.00	412.39	7165.33	121.45	1.36

F.7 Daily Operating Costs by Link for 2000 Three-Yard Directional Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	57.00	99.26	57.54	473.48	47.23	14.34	748.85	93.61	4.54
27	2121.67	1071.46	1230.98	4644.73	587.84	416.52	10073.20	143.90	1.67
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	953.95	373.27	343.58	1582.55	218.23	134.32	3605.91	171.71	1.83
30	157.61	49.14	67.11	231.90	32.90	32.45	571.10	190.37	1.53
31	595.53	375.41	527.88	1681.80	198.96	176.80	3556.36	58.30	.64
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	196.45	270.39	303.81	1266.25	129.98	111.67	2278.55	43.82	.66
34	328.60	404.62	460.78	1886.78	196.50	181.89	3459.18	66.52	.98
35	566.72	274.14	259.87	1201.36	153.17	99.12	2554.38	94.61	1.06
42	.22	13.06	8.29	62.77	5.70	.43	90.46	15.08	3.12

F.8 Daily Operating Costs by Link for 1985 Three-Yard Bidirectional Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	868.49	421.90	366.53	1798.97	231.70	98.89	3786.48	90.15	1.56
2	258.56	161.67	174.35	742.42	87.20	59.03	1483.22	164.80	2.34
3	363.76	216.63	223.54	958.23	115.40	66.74	1944.29	62.72	.95
4	104.81	99.80	108.48	468.24	50.46	19.60	851.39	50.08	1.36
5	20.38	80.28	94.31	382.76	36.26	28.11	642.09	26.75	.53
6	227.54	367.02	481.78	1703.33	172.34	134.39	3086.40	58.23	1.04
7	28.40	71.72	97.11	345.57	33.43	9.23	585.46	73.18	3.59
8	20.17	6.49	6.82	30.73	4.30	2.67	71.18	35.59	.41
9	408.46	190.33	148.17	818.87	106.32	53.94	1726.09	82.19	1.14
10	91.30	128.69	130.25	592.89	60.97	37.51	1041.61	35.92	.74
11	137.99	101.84	122.37	459.13	52.42	36.80	910.55	43.36	.62
12	40.79	0.	0.	9.87	0.	0.	50.67	0.	0.
13	55.47	57.38	66.96	269.26	28.66	6.49	484.20	60.53	2.97
14	215.11	176.29	164.08	784.95	88.23	50.39	1479.05	59.16	1.09
15	78.43	139.24	205.73	659.41	65.78	50.03	1198.62	70.51	1.18
17	202.70	172.61	269.13	801.69	88.27	76.83	1611.23	67.13	.97
18	64.29	101.16	67.82	479.72	48.39	8.26	769.63	85.51	6.16
19	317.51	211.42	234.09	942.39	110.35	63.24	1879.00	60.61	.98
20	422.66	255.63	285.28	1121.84	135.01	88.89	2309.32	64.15	.84
21	262.48	155.39	166.06	682.30	82.51	54.90	1403.63	43.86	.58
22	26.02	52.72	36.35	251.55	24.77	4.44	395.85	43.98	3.17
23	69.43	200.23	330.63	965.01	92.60	109.98	1767.86	49.11	.61
24	439.11	423.89	595.18	1938.49	210.11	205.19	3811.97	53.69	.69
25	405.60	314.19	426.16	1437.44	161.79	156.67	2901.86	90.68	1.04

F.8 Daily Operating Costs by Link for 1985 Three-Yard Bidirectional Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	40.79	0.	0.	9.87	0.	0.	50.67	0.	0.
27	1533.20	782.29	844.17	3403.59	428.93	300.78	7292.95	143.00	1.68
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	392.15	117.24	127.72	525.47	77.61	45.12	1285.32	214.22	2.27
30	61.19	0.	0.	14.81	0.	0.	76.00	0.	0.
31	481.74	295.54	364.73	1308.71	156.45	131.16	2738.33	50.71	.59
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	104.91	170.74	192.88	804.88	81.04	56.58	1411.04	47.03	.85
34	175.62	212.99	233.37	990.17	103.41	71.88	1787.44	59.58	1.02
35	197.11	44.13	40.16	196.62	32.84	14.23	525.08	87.51	.93
42	.22	11.64	7.31	55.74	5.07	.37	80.36	13.39	2.77

F.9 Daily Operating Costs by Link for 2000 Three-Yard Bidirectional Alternative

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
1	1076.41	445.62	386.72	1891.64	256.03	123.51	4179.93	92.89	1.28
2	304.99	180.82	203.14	828.56	98.58	76.61	1692.70	169.27	2.07
3	488.62	256.02	272.14	1126.94	140.37	93.46	2377.55	64.26	.82
4	117.26	102.65	113.89	482.28	52.66	26.93	895.68	52.69	1.11
5	32.45	85.02	104.48	402.97	39.03	33.39	697.35	23.25	.38
6	320.93	427.90	613.00	1988.40	205.29	210.43	3765.94	62.77	.87
7	32.08	65.31	84.93	313.97	30.85	11.24	538.39	67.30	2.26
8	24.29	6.49	6.82	30.73	4.61	3.78	76.72	38.36	.31
9	615.10	275.05	235.95	1177.95	155.11	88.60	2547.77	84.93	1.05
10	130.56	154.81	175.60	713.63	74.93	58.36	1307.89	38.47	.62
11	180.85	113.24	140.77	510.51	60.35	52.04	1057.76	45.99	.52
12	40.79	0.	0.	9.87	0.	0.	50.67	0.	0.
13	62.22	57.38	66.96	269.26	29.16	9.68	494.66	61.83	2.08
14	301.80	210.55	212.57	934.56	108.52	72.04	1840.04	61.33	.93
15	105.07	174.56	274.13	831.52	83.34	88.66	1557.27	86.51	1.05
17	282.09	230.25	394.24	1075.02	119.05	142.97	2243.61	80.13	.88
18	76.74	101.16	67.82	479.72	49.32	15.96	790.71	87.86	3.27
19	456.00	243.54	282.41	1081.47	133.58	96.44	2293.44	63.71	.76
20	588.37	311.49	354.67	1363.17	169.73	126.85	2914.27	66.23	.73
21	366.23	201.36	225.64	885.51	108.98	84.04	1871.77	46.79	.53
22	31.29	52.72	36.35	251.55	25.17	8.69	405.77	45.09	1.68
23	86.17	300.87	533.84	1458.14	138.39	199.51	2716.91	67.92	.73
24	661.34	602.77	885.36	2761.24	301.90	313.37	5525.98	56.97	.66
25	633.93	580.23	901.78	2671.30	291.41	317.66	5396.31	103.78	1.19

F.9 Daily Operating Costs by Link for 2000 Three-Yard Bidirectional Alternative (continued)

Link Number	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
26	40.79	0.	0.	9.87	0.	0.	50.67	0.	0.
27	2276.14	1145.90	1245.75	4963.22	628.89	450.43	10710.34	142.80	1.61
28	0.	0.	0.	0.	0.	0.	0.	0.	0.
29	609.67	175.14	205.16	769.89	116.60	80.25	1956.71	217.41	1.96
30	61.19	0.	0.	14.81	0.	0.	76.00	0.	0.
31	707.34	432.03	547.70	1911.32	228.80	195.81	4023.02	51.58	.57
32	0.	0.	0.	0.	0.	0.	0.	0.	0.
33	128.50	201.70	237.97	954.47	96.35	85.51	1704.51	53.27	.78
34	213.70	228.66	259.46	1062.62	112.87	92.47	1969.77	61.56	.87
35	298.48	69.05	71.49	300.33	50.09	27.46	816.89	90.77	.82
42	.22	11.64	7.31	55.74	5.07	.37	80.36	13.39	2.77

F.10 Daily Operating Costs by Operating Railroad for 1979 No Build Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	604.10	1659.24	1619.10	7971.37	767.60	514.00	13135.41	486.50	10.51
AT	25.73	332.66	181.90	1528.20	141.49	9.74	2219.72	369.95	76.54
BN	397.01	436.04	625.32	2084.78	218.84	238.56	4000.55	800.11	10.50
BO	261.05	389.27	777.41	1875.93	189.47	196.06	3689.19	409.91	6.56
CR	1289.01	1652.87	3189.72	7893.19	812.63	899.09	15736.51	524.55	7.64
CW	263.89	366.47	669.82	1754.49	178.86	181.12	3414.65	682.93	11.50
IC	1093.62	1316.94	1827.08	6257.07	650.07	402.63	11547.42	412.41	9.54
IT	54.07	203.38	182.93	972.56	92.25	51.21	1556.39	311.28	9.10
KT	0.	0.	0.	0.	0.	0.	0.	0.	0.
LN	9.68	37.05	66.30	179.28	16.95	14.56	323.83	323.83	5.58
MP	1505.55	1557.92	2095.72	7289.49	776.47	690.60	13915.75	331.33	4.39
MS	24.36	64.28	73.63	305.43	29.56	16.25	513.51	256.76	6.19
NW	947.86	1165.21	1599.00	5555.77	575.16	684.55	10527.56	809.81	10.66
NY	0.	0.	0.	0.	0.	0.	0.	0.	0.
RI	0.	0.	0.	0.	0.	0.	0.	0.	0.
SF	75.10	179.55	267.70	856.19	83.31	63.01	1524.87	508.29	9.90
SO	31.56	60.32	74.16	286.95	28.41	31.73	513.14	256.57	3.59
SW	592.57	554.47	781.03	2534.17	276.09	187.79	4926.13	289.77	4.70
TO	0.	0.	0.	0.	0.	0.	0.	0.	0.
TR	1053.54	2464.15	2568.79	11803.11	1149.06	704.87	19743.51	282.05	6.98
GRAND TOTALS	8292.44	12439.80	16599.60	59160.31	5986.24	4885.78	107364.17	405.15	7.44

F.11 Daily Operating Costs by Operating Railroad for 1985 No Build Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	570.44	1664.72	1680.61	8004.87	768.00	556.12	13244.76	473.03	9.45
AT	26.58	255.69	129.23	1149.21	107.36	6.59	1674.68	279.11	57.75
BN	427.80	526.47	789.69	2531.22	261.41	292.05	4828.64	965.73	12.19
BO	245.50	448.11	958.35	2166.06	214.48	274.34	4306.84	538.35	6.91
CR	1121.22	1547.64	2804.72	7421.11	756.75	978.92	14630.36	541.87	6.62
CW	351.47	454.36	911.46	2186.97	224.46	291.47	4420.19	884.04	11.88
IC	1214.91	1184.64	1582.39	5686.48	606.45	452.88	10727.75	466.42	8.46
IT	56.32	289.85	268.28	1396.85	130.73	79.81	2221.83	444.37	12.41
KT	0.	0.	0.	0.	0.	0.	0.	0.	0.
LN	10.58	39.19	70.36	189.80	17.97	17.32	345.22	345.22	5.31
MP	2520.95	2456.74	3659.16	11548.56	1239.47	1322.69	22747.57	429.20	5.15
MS	25.30	50.74	56.14	238.41	23.58	15.82	409.99	205.00	4.36
NW	1142.96	1289.21	1932.64	6179.91	645.91	826.39	12017.02	924.39	10.48
NY	0.	0.	0.	0.	0.	0.	0.	0.	0.
RI	0.	0.	0.	0.	0.	0.	0.	0.	0.
SF	92.65	193.81	316.56	933.58	91.50	67.92	1696.02	565.34	8.97
SO	39.18	128.02	204.43	620.73	59.10	132.77	1184.23	592.11	6.20
SW	733.11	1044.07	1678.09	4944.05	504.09	505.95	9409.37	553.49	6.93
TO	0.	0.	0.	0.	0.	0.	0.	0.	0.
TR	1161.67	2880.51	3038.44	13853.64	1342.19	983.08	23259.53	332.28	6.98
GRAND TOTALS	9753.40	14453.76	20080.54	69053.91	6993.44	6804.11	127139.17	474.40	7.36

F.12 Daily Operating Costs by Operating Railroad for 2000 No Build Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	705.09	1750.23	1788.29	8421.94	815.79	795.55	14276.89	509.89	7.82
AT	24.33	278.18	144.84	1260.11	117.20	7.36	1832.00	305.33	63.17
BN	370.48	526.47	789.69	2524.33	256.60	261.85	4729.41	945.88	12.75
BO	404.07	641.91	1386.26	3088.59	310.09	460.50	6291.42	571.95	6.66
CR	1423.55	1787.60	3385.32	8563.92	883.13	1323.12	17366.63	542.71	5.35
CW	680.03	834.62	1684.12	4016.94	414.87	564.56	8195.14	910.57	9.53
IC	1607.22	1539.01	2074.55	7341.71	786.60	664.78	14013.87	467.13	7.21
IT	57.45	262.05	249.26	1259.25	118.41	82.13	2028.54	405.71	9.75
KT	0.	0.	0.	0.	0.	0.	0.	0.	0.
LN	14.11	39.19	70.36	189.82	18.23	23.98	355.68	355.68	3.95
MP	4263.33	4075.19	6398.08	19119.43	2059.35	2268.70	38184.08	489.54	5.67
MS	18.92	50.74	56.14	238.09	23.08	11.34	398.30	199.15	5.38
NW	1452.50	1698.84	2702.78	8139.64	846.82	1207.56	16048.14	1003.01	10.48
NY	0.	0.	0.	0.	0.	0.	0.	0.	0.
RI	0.	0.	0.	0.	0.	0.	0.	0.	0.
SF	161.89	231.33	400.49	1114.22	113.06	128.86	2149.86	537.46	5.78
SO	64.92	199.75	326.20	961.89	91.99	149.55	1794.29	448.57	4.71
SW	861.37	1097.90	1876.79	5193.54	536.46	653.76	10219.84	567.77	6.18
TO	0.	0.	0.	0.	0.	0.	0.	0.	0.
TR	1369.31	3212.67	3435.24	15471.99	1504.05	1445.11	26438.37	362.17	5.83
GRAND TOTALS	13491.31	18225.68	26768.39	86907.85	8895.72	10048.70	164337.64	510.37	6.63

F.13 Daily Operating Costs by Operating Railroad for 1985 Two-Yard Directional Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	310.55	416.26	335.22	1888.77	196.17	94.63	3241.60	147.35	3.41
AT	21.79	188.68	78.51	806.97	76.31	3.99	1176.26	196.04	40.56
BN	314.67	141.48	162.75	638.70	82.11	59.94	1399.66	279.93	3.53
BO	181.46	137.77	207.48	621.69	70.57	56.31	1275.28	115.93	1.93
CR	1055.22	555.29	712.76	2489.92	307.53	228.21	5348.94	172.55	2.33
CW	583.44	250.85	307.81	1144.26	148.39	147.61	2582.36	322.80	3.18
IC	832.40	890.56	815.28	3962.46	426.41	180.98	7108.09	177.70	4.36
IT	42.24	41.94	47.42	192.70	20.77	18.63	363.71	121.24	2.18
KT	77.21	88.08	98.41	399.90	42.39	20.18	726.17	181.54	3.36
LN	26.80	27.78	36.26	127.44	13.65	10.11	242.04	80.68	1.25
MP	2434.43	1327.12	1696.03	5975.10	730.25	631.64	12794.56	232.63	2.61
MS	12.13	37.44	36.00	171.01	16.54	5.32	278.44	92.81	3.92
NW	843.40	390.22	404.49	1738.02	222.87	149.64	3748.64	220.51	2.96
NY	0.	0.	0.	0.	0.	0.	0.	0.	0.
RI	15.87	9.65	23.05	44.53	5.25	4.42	102.77	51.39	.62
SF	429.28	336.10	455.98	1533.19	172.39	149.11	3076.05	180.94	2.25
SO	76.67	56.83	107.41	268.31	30.14	44.89	584.24	83.46	.71
SW	724.98	383.50	465.38	1695.26	210.28	155.84	3635.24	227.20	2.62
TO	113.25	297.18	212.24	1359.05	132.71	26.90	2141.33	152.95	9.39
TR	355.68	399.58	373.02	1834.66	194.24	104.84	3262.02	83.64	1.79
GRAND TOTALS	8461.66	5976.31	6575.51	26894.41	3098.98	2093.19	53100.06	175.25	2.74

F.14 Daily Operating Costs by Operating Railroad for 2000 Two-Yard Directional Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	395.07	444.05	371.12	2025.85	214.87	138.62	3589.59	163.16	2.76
AT	20.64	188.68	78.51	806.69	76.20	3.99	1174.71	195.79	40.51
BN	351.38	134.35	147.92	601.01	81.51	57.66	1373.84	274.77	3.05
BO	354.96	186.58	292.05	837.64	103.44	92.30	1866.98	155.58	1.88
CR	1336.39	601.26	772.45	2686.01	346.77	294.14	6037.02	188.66	1.94
CW	922.52	417.02	519.04	1876.23	241.18	214.66	4190.65	322.36	3.35
IC	1022.52	916.44	863.54	4079.77	451.41	238.81	7572.50	180.30	3.54
IT	38.22	41.94	47.42	191.80	20.40	18.15	357.93	119.31	2.22
KT	94.68	88.79	99.33	403.93	44.05	26.41	757.19	189.30	2.70
LN	35.65	27.78	36.26	127.44	14.32	13.99	255.44	85.15	.93
MP	3432.03	2161.80	2861.31	9677.17	1145.33	957.96	20235.59	252.94	3.05
MS	17.77	33.87	31.40	153.46	15.38	7.02	258.90	86.30	2.38
NW	1034.22	489.12	531.88	2167.09	276.78	202.18	4701.27	235.06	2.88
NY	0.	0.	0.	0.	0.	0.	0.	0.	0.
RI	13.09	5.54	15.91	25.98	3.35	4.58	68.45	68.45	.46
SF	606.21	470.82	697.44	2161.67	242.90	241.34	4420.39	210.49	2.18
SO	125.08	159.39	280.36	731.12	76.17	86.09	1458.22	121.52	1.29
SW	818.43	395.99	488.70	1738.79	221.49	187.21	3850.62	226.51	2.29
TO	199.44	311.74	219.56	1425.98	145.29	58.96	2360.97	168.64	5.23
TR	390.04	358.81	324.84	1640.32	179.19	118.33	3011.54	81.39	1.34
GRAND TOTALS	11218.54	7433.98	8679.05	33360.43	3900.02	2962.40	67554.43	194.68	2.59

F.15 Daily Operating Costs by Operating Railroad for 1985 Three-Yard Directional Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	378.06	521.47	438.54	2394.08	247.02	133.49	4112.65	137.09	3.09
AT	26.22	192.25	80.95	825.60	78.30	4.10	1207.42	201.24	41.64
BN	317.56	143.45	145.71	641.66	82.70	50.61	1381.70	230.28	3.39
BO	182.27	148.46	216.58	675.33	75.45	57.99	1356.09	135.61	2.02
CR	1039.20	642.87	856.79	2919.52	345.12	277.57	6081.06	202.70	2.64
CW	583.94	223.68	260.28	1000.75	135.63	113.57	2317.84	257.54	2.86
IC	777.50	904.76	963.27	4098.51	433.56	229.24	7406.83	200.18	4.73
IT	51.64	32.21	44.65	150.96	17.61	17.25	314.32	314.32	3.08
KT	79.88	129.41	164.33	604.17	61.01	37.33	1076.13	269.03	4.98
LN	56.35	39.88	72.78	181.33	20.82	15.96	387.12	129.04	1.93
MP	2698.94	1372.21	1634.79	6127.01	764.86	613.77	13211.58	269.62	3.05
MS	18.87	39.41	36.81	176.36	17.60	6.13	295.18	98.39	3.28
NW	848.34	434.31	477.17	1944.45	242.03	179.82	4126.12	242.71	3.20
NY	104.38	186.95	167.96	870.86	87.16	41.26	1458.58	85.80	1.92
RI	18.20	8.94	20.40	41.58	5.15	3.92	98.19	49.09	.59
SF	242.61	245.67	369.37	1131.77	121.50	117.79	2228.71	131.10	1.63
SO	76.27	73.22	151.08	348.95	37.38	60.61	747.53	106.79	.91
SW	629.85	338.93	412.33	1481.08	183.74	123.07	3169.01	211.27	2.60
TO	113.67	268.98	184.68	1213.39	119.70	23.30	1923.72	137.41	8.78
TR	197.19	281.29	259.56	1307.80	133.97	61.07	2240.88	89.64	2.19
GRAND TOTALS	8451.13	6228.36	6958.04	28137.61	3210.33	2167.84	55153.31	182.63	2.92

F.16 Daily Operating Costs by Operating Railroad for 2000 Three-Yard Directional Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	461.65	521.47	438.54	2393.60	253.25	175.87	4244.38	141.48	2.46
AT	23.21	187.26	77.54	800.29	75.81	3.92	1168.03	194.67	40.28
BN	281.40	194.76	243.13	889.73	102.44	65.00	1776.46	296.08	4.61
BO	345.26	267.98	420.23	1233.39	138.50	126.56	2531.91	210.99	2.55
CR	1324.79	815.13	1139.35	3734.23	440.56	442.84	7896.90	246.78	2.53
CW	922.53	405.62	506.04	1820.07	236.12	213.78	4104.16	315.70	3.28
IC	998.33	971.56	1062.26	4408.79	478.40	316.22	8235.56	216.73	3.85
IT	41.99	32.21	44.65	148.63	16.71	17.25	301.44	301.44	2.96
KT	93.57	130.12	163.95	607.28	62.32	47.13	1104.39	276.10	3.94
LN	78.13	67.68	159.29	318.39	34.81	51.61	709.91	236.64	2.17
MP	4000.06	2366.66	3019.37	10551.71	1268.88	1029.26	22235.94	300.49	3.55
MS	23.63	39.41	36.81	176.28	17.95	8.05	302.13	100.71	2.58
NW	954.94	517.56	580.01	2312.43	283.87	225.45	4874.26	243.71	2.95
NY	121.02	201.92	189.89	944.06	95.02	63.99	1615.90	95.05	1.67
RI	24.19	8.94	20.40	41.66	5.61	5.95	106.75	53.37	.42
SF	346.02	386.36	643.31	1806.44	190.41	227.79	3600.33	171.44	1.78
SO	122.78	157.57	255.16	722.72	75.23	74.42	1407.87	117.32	1.25
SW	746.35	382.07	486.04	1677.19	210.42	173.94	3676.01	229.75	2.37
TO	196.11	266.84	184.51	1204.00	125.02	50.73	2027.21	144.80	4.49
TR	250.87	283.50	272.98	1315.24	138.72	90.33	2351.64	87.10	1.59
GRAND TOTALS	11367.02	8204.62	9943.45	37108.58	4250.07	3410.08	74283.81	211.63	2.83

F.17 Daily Operating Costs by Operating Railroad for 1985 Three-Yard Bidirectional Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	157.17	253.49	229.51	1154.91	117.42	65.26	1977.75	152.13	3.41
AT	22.86	207.21	91.19	898.51	84.64	4.66	1309.08	218.18	45.14
BN	343.25	163.62	175.75	730.93	92.84	61.85	1568.24	224.03	3.23
BO	183.80	146.48	205.92	662.82	74.48	55.05	1328.55	132.86	1.98
CR	981.21	621.96	819.33	2810.61	331.03	244.60	5808.74	193.62	2.60
CW	552.79	175.80	206.96	790.47	113.93	86.18	1926.13	214.01	2.38
IC	801.69	719.62	778.97	3261.98	358.75	177.20	6098.21	217.79	4.64
IT	82.68	132.08	110.40	596.53	60.85	32.28	1014.81	202.96	5.13
KT	72.80	78.66	93.64	362.26	38.53	17.06	662.95	165.74	3.07
LN	129.18	82.61	126.41	371.48	43.75	31.07	784.49	196.12	2.63
MP	2398.99	1378.36	1663.33	6178.53	746.69	617.01	12982.91	236.05	2.76
MS	34.10	48.27	39.47	216.48	22.41	10.09	370.82	92.70	2.27
NW	958.74	398.93	441.71	1803.61	237.10	176.05	4016.14	267.74	3.14
NY	62.39	92.84	76.62	428.36	43.77	27.75	731.73	73.17	1.47
RI	12.65	28.90	92.03	138.53	13.51	17.42	303.03	151.52	1.81
SF	421.58	430.56	619.15	1991.14	213.25	184.40	3860.08	203.16	2.71
SO	42.74	53.98	100.27	250.78	26.06	30.65	504.48	72.07	.69
SW	485.87	335.24	419.00	1473.21	172.07	126.32	3011.72	188.23	2.58
TO	42.46	114.67	81.02	521.36	50.89	8.62	819.01	117.00	8.36
TR	186.65	277.80	240.84	1277.87	130.67	68.83	2182.66	94.90	2.26
GRAND TOTALS	8116.37	5741.08	6611.53	25954.92	2972.63	2042.32	51438.84	187.73	2.85

F.18 Daily Operating Costs by Operating Railroad for 2000 Three-Yard Bidirectional Alternative

Road ID	MOW Cost	MOE Cost	Capital Cost	Transportation Cost	Administration Cost	Car Cost	Total Cost	Dollars Per Train	Dollars Per Car
AS	201.50	253.49	229.51	1154.78	120.73	82.17	2042.17	157.09	2.61
AT	21.16	202.22	87.78	873.52	82.27	4.48	1271.43	211.90	43.84
BN	369.25	163.62	175.75	728.15	94.58	70.24	1601.58	228.80	2.90
BO	356.39	227.44	339.59	1035.43	121.44	107.99	2188.28	182.36	2.21
CR	1290.14	731.43	1014.47	3315.04	400.25	382.20	7133.52	222.92	2.24
CW	894.89	318.77	372.84	1409.98	196.77	141.36	3334.63	256.51	2.66
IC	1058.92	797.50	893.98	3619.42	410.69	268.36	7048.86	243.06	3.75
IT	95.56	123.52	99.36	553.45	57.94	32.77	962.61	192.52	3.98
KT	83.84	83.65	100.08	386.49	41.55	25.85	721.46	180.37	2.58
LN	163.64	82.61	126.41	370.76	46.28	42.27	831.96	207.99	2.02
MP	3702.68	2333.03	3032.48	10446.52	1236.17	1065.54	21816.43	272.71	3.11
MS	30.52	56.82	50.52	258.20	25.92	12.91	434.89	108.72	2.79
NW	1151.10	488.02	554.39	2183.38	286.69	232.18	4895.76	271.99	2.85
NY	58.64	92.84	76.62	427.22	43.40	27.29	726.02	72.60	1.34
RI	18.36	45.29	153.00	219.30	21.22	44.19	501.36	250.68	1.98
SF	620.00	552.60	825.60	2550.13	279.20	288.53	5116.07	222.44	2.34
SO	159.62	151.87	269.00	694.06	75.42	92.81	1442.78	120.23	1.18
SW	659.83	358.42	434.05	1573.87	194.41	164.06	3384.65	199.10	2.05
TO	57.93	111.82	77.34	506.72	50.74	14.84	819.39	117.06	4.88
TR	214.88	268.94	235.32	1241.18	129.37	86.50	2176.18	98.92	1.83
GRAND TOTALS	11351.62	7443.92	9148.08	33582.15	3915.03	3186.54	68627.33	214.46	2.67

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